THE IRON TRADE REVIEW

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Deferred Shipments Foreshadow Higher Prices

Large Orders for Cars and Locomotives Placed by the Railroads—Pig Iron Active at Higher Prices—Wire Products and Ferro-Manganese Advance

Constantly increasing difficulties in obtaining satisfactory deliveries of all products and a marked tendency toward higher prices are the features of the week's developments in the iron and steel trade. The growing scarcity of labor is a factor of great concern, which not only involves production and subsequent curtailed shipments, but also operating costs, that already have been increased. Wage advances for common labor are more widespread, but despite these inducements the working forces have not been increased. Wire products were advanced $1 a ton and as the trade was notified of the pending increase in prices, a large tonnage of fabricating wire for third quarter and last half shipment was placed with the mills. New tonnage in many lines, notably steel and iron bars, shapes and plates shows no diminution and large consumers are being forced to pay warehouse prices for material for early delivery. One of the leading independent steel manufacturers has notified its sales force to accept no further orders without first submitting the specifications to the home office. On such products as shapes and plates shipments cannot be promised in less than four months and the mills are displaying little interest in the large volume of structural orders that are pending. In the east one large interest booked approximately 25,000 tons last week, which is practically twice the capacity of its mills. Western requirements for early shipment are steadily flowing to eastern works.

Pig Iron

In all centers, with the exception of Cleveland, the pig iron market has developed increased strength. Shipments from practically all merchant stacks exceed production and big inroads are being made in accumulated stocks. Third quarter tonnage has been largely covered and for fourth quarter delivery the furnaces are asking higher prices. The entire buying movement is on a much broader basis than any time this year and in the Chicago district foundrymen are beginning to consider their 1913 requirements. The largest southern operators are now asking $12 for No. 2 for delivery the remainder of the year, although some tonnage is still available at $11.50 to $11.75. Twenty coke furnaces and two charcoal stacks are now in operation in the Birmingham district and notwithstanding the increased production, stocks are steadily declining. No. 2 foundry is firm at $13.50, valley, and while this price has been shaded by one interest in the Cleveland district, one local furnace at that place refuses to consider less than $14. At Buffalo, foundry iron has been advanced to $14.25 and one sale for spot shipment was made at Detroit at $14.75 for No. 2. Pittsburgh reports sales of 7,000 tons of basic for third quarter at $13.50, valley, and approximately 8,000 tons of foundry and malleable at the same price. In the east, inquiry has been made for 5,000 to 10,000 tons of basic for the fourth quarter and some makers are asking $16 for this delivery. The Baldwin Locomotive Co. has taken 2,000 tons of mixed grades and an inquiry for 10,000 to 25,000 tons of malleable iron for shipment the first six months of next year to New England is pending. Virginia foundry grades have been advanced to $13.50 for No. 2X for the last three months of the year and the largest operator in this district is sold up. The chief development in the Hanging Rock region in southern Ohio is the pending merger of the furnaces operated by the Marting Iron & Steel Co., the Ironton Iron Co. and the Lawrence Iron Co.

Railroad Buying

Large orders for steel cars and locomotives are being placed by the railroads and the tonnage of plates and shapes involved will further increase the mill congestion. Contracts for approximately 400 locomotives have been placed and the car orders include 5,300 by the Boston & Albany in addition to passenger equipment; 2,000 box cars by the Canadian Pacific; 700 by the Denver & Rio Grande and the Buffalo, Rochester & Pittsburgh has entered the market for 500 box cars, 500 gondolas, 100 automobile and 100 refrigerator cars. The Virginian and Southern railways are about to close for 700 freight cars each and additional buying by the New York Central and B. & O. is in prospect. Among the rail orders placed were 10,000 tons by the Canadian Northern; 10,000 to 15,000 tons by the Canadian Pacific and the La Salle Electric has closed for 5,000 tons with the Illinois Steel Co. The Southern New England railroad is in the market for 10,000 tons. Light rails are active and again have been advanced.

Ferro Alloys

English makers of ferro-manganese have announced an advance of $2.50 a ton, to $51, seaboard, for delivery during the first half of next year. Higher prices were foreshadowed by the withdrawal of German makers from the market and large consumers hastened to cover their requirements. One interest contracted for 5,000 tons and the total tonnage involved in the orders placed during the past few days is estimated at 15,000.

PITTSBURGH

Premiums Offered On Plates and Bars

Office of THE IRON TRADE REVIEW, 2148-49 Oliver Bldg., July 23.

The iron and steel market, in nearly all finished lines, is in the hands of the sellers, the question of deliveries being the paramount issue rather than price. Finished lines are steadily advancing and premiums are being paid for prompt deliveries. Semi-finished steel is scarce and higher in price. The plate market is deluged with new tonnage and new inquiries, while specifications are heavier than in June, the record month. Light rails have been advanced and sheets and tin plate are higher. Steel bars are at a premium. Structural material makers are four and five months behind on deliveries. The pig iron market has an upward tendency.

Pig Iron.—There is a marked improvement in the tone of the pig iron market. Inquiries have been more numerous with larger sales. The extreme scarcity of basic and Bessemer pig iron is becoming more apparent. A small sale of Bessemer was made this week at $14.50, valley, for prompt shipment. Between 7,000 and 8,000 tons of basic for third quarter were closed at $13.50, valley. Between 8,000 and 10,000 tons of foundry and malleable also were sold, and almost as much more is under negotiation. These grades are being firmly held at $13.50, valley, for the third quarter. Gray forge has become more active, although sales are somewhat restricted. For third quarter, $13.25 is the minimum. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.50
Basic, Pittsburgh	14.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.15

(Fourth Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	14.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.40

Ferro-Alloys. — The withdrawal of prices for forward shipments of ferro-manganese by foreign makers caused a stir in the alloy market. Prior to this action, inquiries were being received freely for the first half of 1913, and some business was booked at $48.50, Baltimore. Makers advised the American trade that the Italian-Turkish war was making it more difficult to secure ore supplies and that the cost of production had increased. There were rumors of a prospective advance, which started inquiries and buying which did not get far until the withdrawal was announced. Spot manganese can now be secured at $50, Baltimore. Dealers look for an advance of $2 to $3 a ton. Fifty per cent ferro-silicon is quoted at $72.50. The demand is quite active. Domestic grades are in demand and prices are firm, but unchanged.

We quote ferro-manganese at $50.00, Baltimore for prompt delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $72.50, Pittsburgh, for prompt and $70 forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates.—Specifications on plates are heavier than at any time this year and the mills are compelled to still further defer deliveries. The new tonnage is heavy, particularly in car material. New car orders placed include 1,150 for the Denver & Rio Grande; the Boston & Albany, 5,200 cars, which have not yet been distributed, but are divided into 4,000 box cars, 800 coal cars and 400 flat cars. The New England Coal & Coke Co. has ordered 400 steel hopper cars from the Cambria Steel Co. The Canadian Pacific railroad has ordered 2,000 cars from the American builders the past week, 1,000 cars going to the American Car & Foundry Co. and 1,000 cars to the Barney & Smith Co. New inquiries include 1,200 cars for the Buffalo, Rochester & Pittsburgh, and some pending inquiries from the Virginia railroad and the Grand Trunk, which amount to between 3,000 and 4,000 cars. Other inquiries which are understood to be pending include those of the Pennsylvania railroad and the Baltimore & Ohio. Eight hundred tons of plain material were placed with the leading interest for the Carnegie Institute of Technology, and there is an inquiry for 2,500 tons of plates for an addition to the Los Angeles aqueduct. A large amount of small tonnage is also developing in the Pittsburgh territory and there are some round lots of plates and shapes involved in ship construction, both on the seaboard and on the lakes. While the plate market is steady and unchanged on the 1.30c base, some prompt shipment sales were reported at $1 a ton premium. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.30c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over, 100 inches up to 110 inches 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches. 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets. — Specifications are heavy, while new business is on a broader basis than normal for this season of the year. The advance in prices has not restricted the buying movement, particularly for galvanized sheets which are very scarce. All grades are difficult to obtain with any degree of promptness in deliveries. The leading interest is filled up practically to its capacity for the third quarter and is not quoting on fourth quarter tonnage. The shortage of sheet bars is being more quickly recognized when mills seek to place orders for any considerable tonnage. Although the market is nominally $23 for Bessemer and open-hearth sheet bars, some sales have been made at $23.50. We quote the market as follows:

Flat Sheets

Black Sheets.—Nos. 10-12 gage, $1.70 per 100 pounds; Nos. 13-14 gage, $1.75; Nos. 15-16 gage, $1.80; Nos. 17-21 gage, $1.85; Nos. 22-24 gage, $1.90; Nos. 25-26 gage, $1.95; No. 27 gage, $2.00; No. 28 gage, $2.05; No. 29 gage, $2.10; No. 30 gage, $2.20.

Tin mill sizes base 5 cents per 100 pounds under these prices.

Blue Annealed.—Nos. 3-8, $1.40 per 100

pounds; Nos. 9-10, $1.45; Nos. 11-12, $1.50; Nos. 13-14, $1.55; Nos. 15-16, $1.65.

Galvanized.

Nos. 10-11 gage, $2.15 per 100 pounds; Nos. 12-14 gage, $2.25; Nos. 15-16 gage, $2.40; Nos. 17-21 gage, $2.55; Nos. 22-24 gage, $2.65; Nos. 25-26 gage, $2.85; No. 27, gage, $3.00; No. 28 gage, $3.15; No. 29, gage, $3.25; No. 30 gage, $3.45.

Roofing Sheets

Net extras on all gages per 100 pounds.

Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c, 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—The new price for tin plate, with a minimum of $3.50 per base box, has become effective throughout the Pittsburgh territory, and current trade is extremely heavy. The terne plate market is stronger and buying has broadened. Large consumers of tin plate are specifying heavily. Some have exceeded their contract shipments and are freely supplementing their former orders with round lots at the present prices. In both tin and terne plate export business has been at a better average price than for some time, and new buying for this quarter has been one of the strong factors that has absorbed what spare capacity existed. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.50, f. o. b. mill, Piftsburgh district.

Rails and Track Material. — The market for light rails is more active and buying is on a larger scale than for many months. Prices were advanced by the leading interest on all light sections, $1.80 per ton, effective July 23. Forty-five-pound sections are quoted at $1.19 per 100 pounds and 8-pound sections, $1.34 per 100 pounds, in carload lots. While light rail prices have been held very firmly in the past at $1.15, base, by the leading interest, on large lots concessions of $1 a ton have been made. These have been withdrawn. Standard Bessemer rails are more active, and mills report a better tonnage. Open-hearth standard section rails are from two to three months behind on deliveries. Specifications are heavy. The scarcity of steel has affected the rail mills quite seriously, the open-hearth steel supply being below the demand and resulted in a curtailment of production in the finishing departments of the leading mills. In track material the same condition of activity is noted. The advance in railroad spikes has been firmly maintained, and makers are further behind on deliveries than they were a week ago. Splice bars and track bolts are also very strong and specifying continues on a large scale. The market is quoted as follows, with the base price on open-hearth steel rails 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds; 1.19c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.00c to 2.20c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.60 to 1.65
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅞	.20
3, 3½, 4 and 4½ x ¾	.30
2½ x ¾	.40
2½, 3 and 3½ x ⅞	.60
2 x ⅞	.80

Steel.—The scarcity of both rolling billets and sheet bars has been accentuated during the week. Makers in Pittsburgh are well sold up and are practically out of the market. Some small producers with surplus tonnage have been disposing of their spare lots at good prices. Youngstown makers are also in a strong position, and are not seeking new trade for the remainder of this quarter, and hesitate to quote on fourth quarter delivery. One quotation from Youngstown on fourth quarter open-hearth sheet bars was $24, mill, with no concession to a Pittsburgh shipping point. The same price seems to rule with much regularity on small billets, while larger billets bring a concession of as much as $1 a ton. Forging billets are in good demand and scarce. The leading interest is out of the market for all semi-finished steel and is behind on deliveries. Quotations on forging billets are from $28 to $29.50, Pittsburgh, on such tonnage as is available, the higher price being for prompt shipment.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $23.00, with the usual extra for size and analysis, and open-hearth rolling billets, $23.00. Bessemer sheet and tin bars are quoted at $23.00, and open-hearth sheet bars are quoted at $23.00 f. o. b. Pittsburgh and Youngstown for third quarter, with full freight to destination added. Forging billets are quoted at $28.00, Pittsburgh.

Hoops and Bands.—Leading makers of steel hoops and bands report an increased demand. Some of the leading makers are increasing their capacity. The market is very strong at 1.40c for steel hoops, and while 1.35c is still recognized as the minimum quotation, that figure has not been quoted during the week. Bands are strong at 1.25c. We quote the market as follows:

Hoops in carload lots, $1.40c, Pittsburgh; in less than carload lots, 1.50c; bands 1.25c, base, with net extras, as per standard steel.

Merchant Bars. — The question of deliveries faces the merchant bar makers, and although July is ordinarily a quiet month, new bookings and the production of the mills exceed that of June. Buyers who have not covered or who have exceeded their contract tonnage find themselves face to face with a premium market, and bar makers are now able to get premiums on prompt shipments. Iron bars are strong at 1.40c, and mills are behind on deliveries. Higher prices for muck bar and increased wages for puddling, make lower than 1.40c for iron bars practically impossible. Scarcity of labor is also interfering with the output. The shafting market is strong, and shafting mills are operating in full. Prices are firm at 60 to 65 per cent off the list.

We quote the market as follows:

Common iron bars, 1.35c to 1.40c, Pittsburgh; Bessemer and open-hearth steel bars, 1.25c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled, and ground shafting, 65 per cent off in carloads and 60 per cent in less than carloads, delivered in base territory.

Muck Bar.—The demand for muck bar is heavier and prices have stiffened. For prompt shipment $30 is quoted, although $29 might be done for forward deliveries. We quote $29 to $30, Pittsburgh, for muck bar.

Structural. — The structural market is more active, and fabricators have increased their tonnage during the week by a volume of small orders that aggregate a very good tonnage. The Blaw Steel Construction Co.'s new plant at Aspinwall, calling for about 1,000 tons of material, has been awarded to the Fort Pitt Bridge Co. The Lawrence Steel Construction Co. will do the erecting. The Noelke-Richards Co. has also taken 600 tons for a new mercantile building at New Castle, Pa., and the Fort Pitt Bridge Co. took 900 tons for a new Carnegie Institute of Technology. These with many others of tonnages varying from 300 to 600 tons are in course of negotiation or have been booked quietly, and it has been asserted that there is not an idle shop among the fabricators in the Pittsburgh district. Great difficulty is being experienced in securing reasonable deliveries, four to five months now being about the average that fabricators place on contracts for work ahead. Higher prices for plain material have aided in bringing about better fabricating prices. The market is very firm. We quote as follows:

Beams and channels, 15 inches and under, zees, 1.30c; tees, 1.30c; angles, from 3 to 6 inches, 1.30c; over 6 inches, 1.40c; universal and sheared, 1.35c; over 15 inches, 1.40c; plates, 6¼ inches wide and wider, 1.40c.

Merchant Pipe.—With a large volume of pipe tonnage pending, pipe makers have withdrawn quotations. All new quotations are made with the expressed stipulation of immediate ac-

ceptance or withdrawal. Some of the larger buyers who had figures on from 60 to 70 miles of line pipe, and who had not closed were among those whose quotations were withdrawn. In merchant pipe specifications are heavy, but the buying movement for new lots is seasonably quiet. Reports from jobbers indicate that they are rapidly disposing of their stocks and the immediate future promises increased buying of merchant pipe. Prices are being held firmly. We quote the official discount to jobbers subject to the usual preferential discount to the larger buyer as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch.....	73	53	68	48
⅜ inch	74	64	69	53
½ inch	77	67	72	59
¾ to 1½ inch.....	80	72	75	64
2 to 3 inches.....	81	74	76	65
	Lap weld.			
2 inches	78	71	72	63
2½ to 4 inches.....	80	73	74	66
4½ to 6 inches.....	79	71	73	65
7 to 12 inches.....	77	67	71	61
13 to 15 inches.....	54	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ⅛ inch.....	69	59	65	55
½ inch	74	68	70	63
¾ to 1½ inch.....	78	72	74	65
2 to 3 inches.....	79	73	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	75	69	71	63
2½ to 4 inches.....	77	71	74	66
4½ to 6 inches.....	76	70	72	65
7 to 8 inches.....	69	59	65	55
9 to 12 inches.....	64	54	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	64	58	60	52
¾ to 1½ inch.....	67	61	63	55
2 to 3 inches.....	69	63	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	65	59	61	52
2½ to 4 inches.....	67	61	63	57
4½ to 6 inches.....	66	60	62	56
7 to 8 inches.....	59	49	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent. merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—Boiler tube makers have so much tonnage that they are seeking to avoid any promises for early deliveries. The tremendous increase in locomotive building and the general expansion in power house building, with the necessary boiler equipment, has filled the boiler tube market with large orders and with many inquiries. The makers are having difficulty in making shipments, and like many other branches of the iron and steel trade they are facing the question of schedule for deliveries. We quote the official discount on steel and charcoal iron boiler tubes as follows:

	Steel.	Iron.
1¼ inch	60	48
1⅜ to 2¼ inch.....	64	50
2½ inch	66½	55
2¾ to 3¼ inch.....	71½	57½
3½ to 4½ inch.....	74	60
5 and 6 inch.....	66½	..
7 to 13 inch.....	64	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—The advance in wire products made by the leading interest on Saturday, July 20, had been well heralded, and a large tonnage of wire products was placed at $1.60. Coincident with this action on the part of makers, which has now become general, has been the cancellation of large tonnages placed on the basis of $1.50, which had not been specified by buyers. Nearly all the makers report a heavy demand. Warehouse stocks of nails and plain wire are small. The new price of $1.65 for nails and $1.45 for plain wire, while not yet thoroughly absorbed by the market, will be well maintained, it is believed. Some small makers are said to be willing to accept a fair lot of new business at $1.60 for wire nails, and $1.40 for plain wire, but refuse to quote this price for other than the earliest shipments possible according to their mill schedules. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.60 to $1.65; retailers' carload lots, $1.65 to $1.70; cut rails (western makers), jobbers' lots, $1.60 to $1.65, painted barb wire, jobbers' carload lots, $1.65 to $1.70; retailers' carload lots, $1.65 to $1.70, with 30c for galvanizing; plain wire to jobbers in carloads, $1.40 to $1.45; and to dealers, in carloads, $1.45 to $1.50; polished staples, $1.60 to $1.65; galvanized staples, $1.90 to $1.95.

Wire Rods.—Activity in the wire trade has strengthened the wire rod market and specifications are heavy. The minimum now quoted is $26 instead of $25.50 for new business. We quote $26 to $27, Pittsburgh, for Bessemer and open-hearth wire rods.

Coke.—Between 300 and 400 cars of standard Connellsville furnace coke have been sold at from $2.25 to $2.40, ovens, for delivery within the next ten days. Coke operators operating in the old basin and in the low sulphur coal fields have rearranged operations and the Producers Coke Co., a co-operative concern controlled largely by small oven owners, has taken over the product of several small plants, which they will handle instead of it going to former buyers and brokers. The actual tonnage unsold by these companies is about 50,000 tons a month. This would appear to mean a break in the coke situation, but the interests behind the Producers Coke Co. declare this is entirely wrong, and they will hold firmly to the fixed price of $2.50 for last half contracts. A large number of other companies, some of which withdrew from the market until $2.50 coke was established, are re-stating their position, fixing the minimum on contract coke at $2.50, but spot coke will be governed largely by supply and demand. Curtailment of production is heavy and with four blast furnaces due to come in within the next two weeks, the coke market promises to strengthen materially. Foundry coke is in good demand, spot coke going at $2.50 to $2.65, and contract coke at $2.50 to $2.75, with a fair average of business moving steadily. The Connellsville *Courier*, for the week ending July 13, reports 30,416 ovens active with a production of 375,557 tons, compared with 30,483 ovens active and a production of 329,161 tons for the previous week. This shows an increase of 46,000 tons. We quote standard Connellsville furnace coke for contract delivery at $2.25 to $2.50, ovens, and for spot shipment $2.35 to $2.40, ovens. For standard Connellsville foundry coke, we quote $2.50 to $2.75 on contract, and $2.50 to $2.65 on spot coke.

Scrap.—The market for old material is quite active. Sales are not large, but there are plenty of buyers to take the tonnage of heavy melting steel offered. Dealers who have been vainly trying to get a better return for their stocks are finding it difficult to obtain more than $13.50 for heavy melting steel. Bundled sheet scrap is fairly active, but unchanged in price. Low phosphorus is a little firmer, and while $15.75 to $16 is nominally the market, some sales were closed the past week at a slightly better price. Turnings at $10.75 to $11 are very firm and stocks are not large. We quote, gross tons, delivered in the Pittsburgh district, including Monessen, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$13.50 to 13.60
Rerolling rails	14.25 to 14.50
Malleable	12.75 to 13.00
Bundled, sheet scrap	12.25 to 12.50
Iron axles	22.00 to 22.50
Old iron rails	15.50 to 16.00
Stove plate	9.00 to 9.50
No. 1 wrought scrap	13.75 to 14.00
Old car wheels	13.75 to 14.00
Low phosphorus	15.75 to 16.00
Machine shop turnings	10.75 to 11.00
Cast borings	10.00 to 10.25
No. 1 cast scrap	13.25 to 13.50

Youngstown, O., molders, who went on strike, have returned to work following the granting of their demands, an increase from $3.30 to $3.50 per day. This becomes the union scale there.

CHICAGO

Pig Iron Strong and Higher

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., July 23.

Consumers are having an increasing amount of difficulty in securing deliveries and premiums are being offered freely for prompt shipment. A small tonnage of iron bars was sold during the week at 1.60c, Chicago. Present indications are that the high record in specifications made during June will be exceeded before the end of the present month. Western producers are unable to take new business in finished lines and are still firm in their refusal to aggravate the congested conditions by taking on business for 1913 delivery. Railroad buying is still maintained at a higher rate and much of the tonnage offered is being forced into eastern markets. Mills of the leading interest are able to consider only such small rail orders as will serve to fill in for the balance of the year. Structural business is very heavy, fabricating shops being well filled, and it is impossible to secure mill delivery on shapes under four months. For this reason contractors are having difficulty in placing such business as they are willing to consider.

Pig Iron. — Northern iron is now firm at $15, f. o. b. local furnace, and while the advanced price has dampened the ardor of buyers to some extent, inquiries are very strong and are appearing for good tonnages. An indication of the increasing demand is found in the fact that many melters are coming into the market for 1913 requirements. The furnaces, however, are not considering anything beyond the last quarter. Many sales for good tonnages for last quarter delivery have been made and inquiries for requirements at that time are increasing. It is evident that many foundries are not covered for immediate requirements and this condition is being aggravated by material increases in business. Practically no southern iron is to be had at $11.50, Birmingham, and the market is now strong on a basis of $12. Inquiries are stronger and for better tonnages and sales are reported in lots ranging from 300 to 2,500 tons. The majority of these are for last quarter delivery, although some of the larger tonnages have been sold for last half. There is a pronounced scarcity of southern iron in this market, some furnaces being out of the market for third quarter and others being able to book very little business for the balance of the year.

The following prices represent the market for Chicago delivery for the balance of the year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.

Lake Superior charcoal	$16.25 to 16.75
Northern foundry No. 2	$15.00
Southern foundry No. 2	16.35
Southern silv'ries, 5 per cent sil.	17.35
Jackson co. silveries, 8 per cent	18.35
Malleable Bessemer	15.00
Alabama basic	15.60

Billets. — Although western producers continue to be a negligible factor in this market, prices are firm on a basis of $28, Pittsburgh. The scarcity which has been brought about by the demand for other finished lines is aggravated by the increased need of labor, and business in this material is going east in large quantities. Rerolling billets are even scarcer than forging, as it is impossible to procure any of the former from western makers. We quote, open-hearth forging billets at $31 and re-rolling billets at $27.50.

Merchant Bars.—The demand for both iron and steel bars is increasing daily and sales of very good tonnages of the former have been made at 1.40c. As in all other finished lines, the total tonnage of specifications is far in excess of productive capacity and it is probable that iron bars at 1.35c will disappear from the market very rapidly. Specifications promise to exceed the high record set in June as independent producers report a greater tonnage for the past two weeks than for any like period during that month. Specifications for steel bars also are increasing and producers in this territory can take but little business for the balance of the year. No business for 1913 has been booked. Store prices are very strong and due to the excessive demand that has been made upon jobbers, their supplies of many sizes have been exhausted and great difficulty is being experienced in making deliveries.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.35c to 1.40c, hard steel bars, rerolled, 1.30c to 1.35c; soft steel bars, bands and small shapes, 1.43c; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 65 per cent off list for carload lots, 60 per cent off for less than carloads.

On iron and steel from local stocks, we quote, as follows:

Bar iron, 1.70c per pound base; soft steel bars, 1.70c to 1.75c per pound base; soft steel hoops, 2.00c, full extras.

Structural Material. — It is almost impossible to secure structural material in this territory and on new business deliveries cannot be obtained in less than four months. Fabricators are having no difficulty in maintaining advanced prices as the shops are being rapidly filled and consumers are offering premiums for prompt shipment. In addition to having their shops filled for the immediate future, contractors are also having difficulty in securing new business as many mills in this territory are refusing to consider any material tonnage for the balance of the year and are making no contracts for next year. On account of this condition further advances in structural quotations may be expected in the near future. The total of the structural contracts let is greatly in excess of that for the previous week, aggregating 18,078 tons, about 60 per cent of which has been taken by the American Bridge Co. This includes 864 tons from the Chicago-Milwaukee railway for a bridge at Spokane, Wash.; 255 tons from the Rock Island for various repairs and 10,258 tons for the Conway building, Chicago. Jones & Laughlin have taken 226 tons from the Chicago-Milwaukee and the Brown Hoisting Machinery Co. has taken 875 tons from the Pittsburgh Coal, Dock & Wharf Co., for a coal handling bridge at Superior, Wis. A contract for 2,228 tons for the Stark building, Louisville, Ky., has been let to the Noelke-Richards Co., and the Kenwood Bridge Co. has taken 302 tons from the Studebaker Corporation, South Bend, Ind., for a kiln sorting and drying building at that place. The Joliet Bridge & Iron Co. has taken two contracts at Chicago, consisting of 572 tons for the Linn building and 818 tons for the Hill building. R. R. Donnelly & Sons has awarded the general contract for its new printing house to the Leonard

Construction Co. The building will require 510 tons of structural material. Other contracts let during the week include 128 tons by the Garden City Spring Works, Chicago, for a forge shop and 120 tons by the Peden Iron & Steel Co. for a warehouse at Houston, Texas. The Lake Shore & Michigan Southern has ordered 480 tons of structural material from the American Bridge Co. and the Chicago & Northwestern Railway Co. has let a contract for 131 tons of material for the Milwaukee avenue viaduct, Chicago. The Mitchell-Lewis Motor Car Co., Racine, Wis., will require 121 tons for steel towers at Racine, and the Horlicks Malted Milk Co. 190 tons for reconstruction work and completing of its malting plant in that city.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.48c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.80 to $1.85 per 100 pounds; angles over 6 inches, $1.90 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.80 per 100 pounds, base; channels, 3 inches and larger, $1.80 per 100 pounds, base.

Rails and Track Fastenings.—As the open-hearth capacity of the mills in this territory is covered by contracts until the first of the year, some western roads are specifying Bessemer rails to obtain early deliveries. Railroad buying is increasing and the tonnage in track fastenings is unusually heavy. Few independent producers are able to take new business and the leading interest is considering only small tonnages that will serve to fill in for the balance of the year. New inquiries are numerous, but as the mills are still firm in their refusal to take business for 1913 delivery, they are going east and often at a premium. The Denver, Laramie & Northwestern is in the market for 5,000 tons of rails and some inquiries for like amounts have been sent out by western roads.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45 pound, 1.20c to 1.25c; 16 to 20-pound, 1.25c to 1.30c; 12-pound, 1.30c to 1.35c; 8-pound, 1.35c to 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.70c, smaller size spikes, 1.70c base; track bolts with square nuts, 2.10c, base.

Plates.—After a slight lull, the activity in car building is again on the increase and the makers are having no difficulty in securing material. Many orders from western car builders have gone into the eastern market and premiums are being offered to western producers for prompt delivery. The mills in this territory, however, are crowded for the balance of the year and as specifications continue to be greatly in excess of their capacities they are able to take very little business. No advance in quotations has been made, although higher prices are expected in the near future. Prompt shipments of plates cannot be obtained and some makers are out of the market for last quarter. No 1913 business is being taken. The Belt railway of Chicago is in the market for five switching locomotives and five Mogul locomotives, and the Chicago, Milwaukee & St. Paul has ordered 50 mikado locomotives and six Mallet locomotives, the last two orders going to the American Locomotive Co. The Illinois Central has ordered 50 mikado locomotives from the Baldwin Locomotive Works and 20 Pacific type locomotives from the American Locomotive Co. The Minneapolis & St. Louis railroad is said to be in the market for 10 locomotives and it is reported that the Chicago Junction railway has ordered six switching locomotives. The last two items have not been confirmed. The San Antonio & Aransas Pass railroad is also reported to have ordered five 30-ton freight cars from the Mt. Vernon Car & Mfg. Co. The Denver & Rio Grande has ordered 700 box cars from the Standard Steel Car Co., 350 gondola cars from the Pressed Steel Car Co., 100 stock cars from the American Car & Foundry Co., and 50 cabooses from the Haskell & Barker Car Co. With this new business on the books of car makers and with plate mills crowded to capacity for the balance of the year, it is probable that higher quotations will materialize soon.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.48c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $1.80.

Sheets.—Specifications on sheets continue very heavy and mills in this territory are not seeking business actively. The advance in price by eastern producers has been followed by a like increase in mill quotations in this territory, and store material is higher. The demand made upon jobbers is very great and much difficulty is found in making deliveries. Stocks of some sizes have been exhausted and it is practically impossible to restock owing to the condition of the mills. This condition will probably bring about further advances in the near future.

We quote f. o. b. Chicago, as follows from stock:

Blue annealed, No. 10, 2.10c; No. 12, 2.15c. Box annealed, No. 28, 2.50c. Galvanized No. 28, 3.60c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—The expected advance became effective this week and wire nails are firm at 1.83c. The movement of wire of all grades is increasing, with fencing somewhat in the lead. In spite of the usual dullness at this season the demand for agricultural wire of all grades is at an increasingly high rate. With a continuance of present conditions a further advance in quotations may be expected before the first of September.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.93, retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—The market for both steel and iron pipe reflects conditions maintaining in other lines and manufacturers in the west find themselves unable to make headway against the increasing requirements. Jobbers are having difficulty in obtaining deliveries and in many cases very little stock is on hand. The extensive building operations which have continued throughout the summer have drawn heavily on the capacity of the makers and further advances may be confidently expected.

We quote, store prices on merchant pipe and tubes as follows:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Black	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	70.2	49.2	63.2	42.2
⅜ inch	74.2	63.2	68.2	52.2
½ inch to 1½ inch.	77.2	68.2	71.2	59.2
Lap.				
2 inch	75.2	67.2	68.2	58.2
4½ inch to 6 inch..	76.2	67.2	59.2	60.2
Card Weight.				
7 inch to 12 inch...	73.2	62.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	65.2	53.2	60.2	48.2
½ inch	70.2	58.2	65.2	53.2
2 inch to 3 inch....	75.2	63.2	....	....
Lap.				
2 inch	71.2	59.2	66.2	54.2
7 inch to 8 inch...	65.2	53.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	58.2	46.2	....	....

¾ inch to 1½ inch.	61.2	49.2	....	....
Lap.				
2 inch	59.2	47.2	....	....
4½ inch to 6 inch..	60.2	48.2	....	....
7 inch to 8 inch....	53.2	41.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	38	..	56½
1¼ to 2¼ inch	54	39	34
2¾ to 3¼ inch	64	49	45
3½ to 4½ inch	66½	49	45
5 to 6 inch	54	..	..

Cast Iron Pipe.—Inquiry for small tonnages continues to furnish the bulk of the business, although considerable new business is reported pending. The recent advance in prices has not retarded buying.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $27.50, 6 to 12 inches, $26.00, larger sizes, $25.00; gas pipe, $1 a ton higher.

Old Material.—The situation in the scrap market remains practically unchanged. While the offerings of the railroads are not large stocks continue to increase slightly and the labor situation shows no improvement. On this account there is a lack of active buying and the market is very quiet. The Chicago & Eastern Illinois has received bids on 645 tons of old material, the principal item of which was 150 tons of No. 1 railroad wrought. The Northern Pacific has offered a list totaling 330 tons, the principal item being 100 tons of railroad wrought. The Chicago, Burlington & Quincy has issued a list of 1,881 tons of mixed scrap, of which the principal items are 300 tons of No. 1 railroad wrought, 300 tons of No. 2, 300 tons of No. 1 cast and 200 tons of malleable.

We quote, for delivery to consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$13.25 to 13.75
Old iron rails	16.50 to 17.00
Rerolling rails (5 ft. and over)	13.00 to 13.50
Old steel rails (3 ft. and under)	12.50 to 13.00
Frogs, switches and guards	11.75 to 12.25
Heavy melting steel	11.50 to 12.00
Shoveling steel	11.50 to 12.00

Net Tons

No. 1 R. R. wrought	$11.75 to 12.25
No. 2 R. R. wrought	10.75 to 11.25
Arch bars and transoms	15.25 to 15.75
Knuckles, couplers and springs	11.75 to 12.25
Shafting	14.50 to 15.00
Iron car axles	19.00 to 19.50
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers forge	9.75 to 10.25
Pipe and flues	8.75 to 9.25
No. 1 cast	11.75 to 12.25
No. 1 busheling	9.75 to 10.25
No. 2 busheling	7.25 to 7.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.50 to 13.50
Cast and mixed borings	6.25 to 6.50
Machine shop turnings	7.00 to 7.25
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.50 to 11.00
Angle bars, splices, etc., iron	14.00 to 14.50
Angle bars, steel	11.25 to 11.75
Stove plate and light cast scrap	10.00 to 10.50

CLEVELAND

Mill Shipments Further Deferred

Office of THE IRON TRADE REVIEW, Penton Bldg., July 23.

Iron Ore.—While sales of ore have been light, probably amounting to 100,000 tons, from interests which had not filled their requirements earlier in the season or were in need of mixtures, inquiries have also been received from furnaces which have hitherto been out of blast. Additional orders may, therefore, be expected.

The movement of ore continues very heavy, but is being handled exclusively in contract vessels, as the sudden slump in the coal trade has released a number of carriers, with the result that they have been going up the lakes light instead of loaded and have been presenting themselves faster at upper lake docks than they could be cared for. The Steel Corporation's movement from Allouez bay is heavy, notwithstanding the physical obstacles which militate at present against heavy shipments from that port; but the Corporation is apparently determined to exploit the Hill mines while its lease lasts. The July movement will not fall far behind that of June, which, as known, was the heaviest in the history of the trade.

It is clear, however, that it requires the co-ordination of the ore, coal and grain trades to keep the lake fleet busy. There are plenty of ships in temporary idleness, but it is not expected that any of them will have to go into ordinary. The lessening in coal shipments is largely due to the fact that a cargo of coal has to be moved from an upper lake dock before another can be put upon it. It looks now as though the coal would have to be moved when the grain is moving, which would obviously be to the wild carriers' advantage. This temporary let-up will probably result in better rates being paid later on.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.05; Mesabi non-Bessemer, $2.85.

Pig Iron.—With the exception of Corrigan, McKinney & Co., all of the leading producing interests have withdrawn from the local market temporarily, owing to the low prices that are prevailing. It is reported that 1,000 tons of No. 2 were sold for delivery at Erie, Pa., on the basis of $12.75, Cleveland, and smaller lots have been closed at prices ranging from $13.25 to $13.50. One large interest refuses to sell into this territory except on the basis of $13.50, valley furnace, equivalent to $14.40, Cleveland, while another is quoting a minimum of $14, Cleveland furnace. Foundry iron in every large consuming center has strengthened materially during the last week, yet, notwithstanding conditions generally prevalent, local quotations are from 50 cents to $1 a ton lower than those in other nearby northern markets. Quotations on deliveries in Cleveland for the remainder of the year have been revised as follows:

No. 1 foundry	$14.25 to $14.50
No. 2 foundry	13.75 to 14.00
No. 2 southern	15.85 to 16.35
Gray forge	13.25
Bessemer	15.15 to 15.30
Lake Superior charcoal	16.25 to 16.50
Jackson co. 8 per cent silvery	18.05

Coke.—Practically all of the large consumers of foundry coke have covered their requirements through the remainder of the year and there is little demand for coke for spot shipment. No sales of furnace coke have been reported although prices ranging from $2.25 to $2.50 for various grades have been quoted. Prices at the ovens are as follows:

Connellsville furnace coke, $2.30 to $2.60 for prompt delivery, and $2.25 to $2.50 on contract; Connellsville foundry coke, $2.75 for prompt, and $2.75 on contract.

Finished Material.—One of the largest independent steel producers has notified its sales agents to accept no additional tonnage for delivery

the remainder of the year without first submitting specifications to the home office. The output of this plant has been practically disposed of until Jan. 1, and other steel works are similarly situated. Deliveries on various products are deferred from 60 days to four months. Following the advance on wire products, effective this week, higher prices are expected on plates, shapes and bars. Bids have been asked for the steel for the 571-foot span for the new high level bridge which will aggregate 3,750 tons, of which one-third will be nickel steel. Bids later will be asked for the 12 steel arches for the east and west approaches. Contractors are now figuring on the steel requirements for five new buildings for the Lima Locomotive Co., at Lima, O. Few of the mills are interested in this work as they will be unable to make shipments in less than four months.

Old Material.—Inquiry for heavy melting steel is better, more than the usual number having come out this week. These inquiries are largely for later delivery at current quotations and dealers are displaying unwillingness to sell at present prices. Local mills are not in the market for prompt scrap, although one dealer reports his first spot sale of bushelling in several weeks. Although the prices of finished products have advanced, buyers do not believe the increase sufficient to warrant a change in scrap quotations. Business for July is expected to show a decrease from the preceding month, largely due to labor scarcity and the fact that the month has been one of general inventory. Corrigan, McKinney & Co. has issued plans for its proposed open-hearth plant. It is reported the plant will use 500 tons of scrap daily, when running to capacity. We quote, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$15.00 to 15.50
Old steel rails (under 6 ft.)	13.00 to 13.50
Old steel rails (over 6 ft.)	13.50 to 14.00
Relaying rails	19.50 to 20.00
Old car wheels	13.00 to 13.50
Old steel boiler plate	10.50 to 11.00
Malleable iron (railroad)	12.50 to 13.00
Steel axles	18.00 to 18.50
Axle turnings	13.00 to 10.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	12.25 to 12.75
Country mixed steel	11.00 to 11.25
Bundled sheet scrap	10.00 to 10.50

Net Tons.

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.50 to 11.00
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	7.75 to 8.00
Pipes and flues	9.50 to 10.00
Wrought drillings	7.75 to 8.00
Stove plate	9.50 to 10.00
Cast borings	7.75 to 8.00
Wrought iron piling plate	14.50 to 15.00
Wrought iron arch bars	14.00 to 14.50

CINCINNATI

Southern Pig Iron Stronger

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., July 23.

Pig Iron.—Southern pig iron quotations are strengthening gradually and $11.50, furnace, for southern No. 2 is the lowest price quoted by the majority of makers in that territory for delivery to Cincinnati and vicinity. Sales at $12, Birmingham, are being made for last quarter delivery, although in some cases $11.50 is being asked to cover the last half of the year. Some furnaces are limiting the tonnage to be sold at present prices. Low grade iron is scarce. The same condition relative to prices, however, does not exist through the entire south, and in some districts furnaces are offering iron at $11.25, Birmingham basis, for spot or third quarter shipment. Some sales have been made recently at this figure, the tonnage placed being probably as large as that sold by the Birmingham furnaces at the higher figure. For the last quarter, $11.50, Birmingham, is the lowest price quoted, but all makes cannot be had at this figure, as some furnaces are holding firm at $12 for this delivery. The southern Ohio iron situation is displaying little activity and there has been no change in price. The chief development in that territory is the proposed merger of the Marting Iron & Steel Co., the Ironton Iron Co., and the Lawrence Iron Co., all Hanging Rock furnaces, the stockholders of which met last week, but so far have kept their negotiations secret. Southern resale iron is being sold readily at $11.25, Birmingham, and southern Ohio resale iron is offered at $13.25, Ironton. Inquiries are limited and involve only small tonnages. There is a good demand for high silicon and charcoal iron. Ferro-manganese is selling in fair-sized lots. Recent inquiries are as follows: One thousand tons of southern No. 4 and 1,000 tons of southern No. 2 from central Ohio; 800 tons of southern No. 3 from Philadelphia territory; 300 tons of southern iron from central Indiana and 300 tons of southern iron from northern Indiana, all for last half shipment. A local firm last week bought about 2,000 tons of southern iron for delivery during the last half.

There have been several inquiries for shipments during the first quarter of next year, but none of the furnaces is anxious to quote. Virginia iron is stronger, and is held at $13.50, furnace, for No. 2X, for the last quarter. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 2	$14.50 to 14.75
Southern foundry No. 3	14.00 to 14.25
Southern foundry No. 4	13.75 to 14.00
Southern gray forge	13.50 to 13.75
Mottled	12.75 to 13.60
Southern No. 1 soft	15.00 to 15.25
Southern No. 2 soft	14.50 to 14.75
Standard southern car wheel	25.50 to 25.75
Northern No. 2 foundry	14.45 to 14.70
Northern No. 3 foundry	13.95 to 14.20
Northern No. 4 foundry	13.70 to 13.95
Jackson co. 8 per cent silicon	17.20 to 17.45

Coke.—Wise county coke is reported stronger and the price has been slightly advanced. An inquiry has been received from the south for 3,000 tons of furnace coke for six months delivery. Coke inquiries aggregate about 80,000 or 90,000 tons. The Hanging Rock furnaces are buying coke to cover immediate requirements only. Foundry coke is selling in small lots, as most of the foundries in this territory have closed for their requirements for the next six months. Connellsville furnace coke is being quoted at from $2.35 to $2.50 and foundry coke at from $2.50 to $2.75. Wise county furnace coke is being held at from $2.25 to $2.40 and foundry coke at the slightly advanced price of from $2.60 to $2.75. We quote from the leading coke producing districts as follows:

Connellsville district.	Prompt shipment.	Contract second half.
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	2.40 to 2.50	2.35 to 2.50
Wise county district:		
Foundry coke	$2.60 to 2.75	$2.60 to 2.75

Furnace coke.....	2.25 to 2.40	*Sliding [scale basis
Pocahontas district:		
Foundry coke.....	$2.25 to 2.50	$2.50 to 2.75
Furnace coke.....	2.00 to 2.25	2.25 to 2.50
New river:		
Foundry coke.....	$2.50 to 3.00	$3.00 to 3.25
Furnace coke.....	2.15 to 2.25	2.35 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Business in bars and structural shapes continues good with prices firm at 1.25c for the former and 1.30c for the latter, Pittsburgh basis. Some of the mills are several months behind on deliveries. Some of the larger companies represented here are refusing to bid on the steel to be used in several of the smaller buildings to be erected here, claiming that their firms are so rushed with business that they could not supply it at the time required. The local sheet market is strong, and the local mill, which has resumed operations after a brief shut-down for repairs, is well supplied with orders, being obliged to refuse several good orders recently. Prices are firm as follows: Black sheets, No. 28, 2.05c, and galvanized sheets, No. 28, 3.15c. For other mill prices, see Pittsburgh report.

Warehouse business is steadily improving, and the orders placed by local houses during the past week have been generally satisfactory. Prices have not been advanced in any case, but they are decidedly firm. We quote warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 1.75c base; iron bars, 1.70c base; structurals, 1.85c base; plates, ¼ inch and over, 1.85c base; sheets, blue annealed No. 10, 1.95c base; rivets, cone head, 2.30c base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 60 per cent discount; 2½ inch, 62 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 67 per cent discount; and 5 to 6 inch, 60 per cent discount; cold rolled shafting, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.85c, ⅝ inch square and larger, 1.95c; ½ inch square and larger, 2.05c; 5-16 to ⅜ inch square and larger, 2.25c; ¼ inch square and larger, 2.35c.

Old Material.—The local scrap iron market is quiet. Prices have not declined to any extent, but they are not firmly established at the quotations made. Local foundries are not using much iron, and a large number have shut down for the summer months. Heavy melting scrap is quoted at about $10, although a good tonnage was recently purchased by a local dealer for $9.75. Bundled sheet scrap is quoted a little lower than last week. Stove plate is held at from $7.50 to $8. We quote prices dealers will pay in Cincinnati and vicinity, as follows:

Gross Tons

Old iron rails	$12.25 to 13.00
Old steel rerolling	10.75 to 11.25
Old iron axles	17.25 to 17.75
Heavy melting scrap	9.75 to 10.25
Relaying rails	19.75 to 20.75
Bundled sheet scrap	7.50 to 8.00

Net Tons.

Old No. 1 R. R. wrought	$10.00 to 10.50
No. 1 machinery cast	10.00 to 10.50
No. 1 busheling	7.75 to 8.50
Stove plate	7.50 to 8.00
Machine shop turnings	6.25 to 6.75
Cast borings	6.00 to 6.50
Heavy turnings	6.75 to 7.25
Mixed cast	8.50 to 9.00
Malleable	7.00 to 7.50

PHILADELPHIA

East Shows Sustained Conditions

Office of THE IRON TRADE REVIEW, Philadelphia, July 23.

There are few, if any, indications of modified conditions in the eastern iron and steel market and a favorable situation is generally reflected. New business is fair and in some cases is notably heavy, being twice as large as capacities. Labor shortages and unrest continue to check the output of eastern steel plants and in some quarters the conditions are quite disturbing. Price advances in finished products have been rather numerous this week. Pig iron continues moderately active and there is further strengthening of prices with little evidence of weakness in any direction. Scrap is rather quiet, but the undertone is strong, especially in heavy steel, in which $14, delivered, again seems at hand.

Pig Iron.—The market shows a broader buying as to grades, and though single sales remain small, as a rule, the aggregate tonnage is very fair. The recent hot weather has had the effect of cutting down the output of the furnaces and of increasing the quantities of fuel used per ton of iron, and these conditions, together with the scarcity of labor, have not been calculated to change the temper of makers in holding prices firmly. Deviation from the $15.75, Philadelphia, minimum, for No. 2X foundry, has practically disappeared, though it is probable that $15.60, delivered, on some hands equivalent to $14.75, Lehigh valley furnace, might still be done. Small sales of standard No. 2X continue to be made at $16 and even $16.25, Philadelphia. The Baldwin Locomotive Works has closed on an inquiry for 2,000 tons of its forge classification for the next several months, from an eastern Pennsylvania furnace. In Virginia iron, the leading maker is sold up for the third quarter and is holding fourth quarter iron on the basis of $13.50, furnace, for No. 2X. This maker and other Virginia furnaces have been selling some fourth quarter iron at this level. The Southern railroad is out for 800 tons of No. 3 for last quarter for Lenor City, Tenn. Though some of the cast iron pipe makers have heavy tonnages of iron bought, they are still receptive buyers in a considerable degree. One eastern shop took about 1,500 tons lower grades in the week. There is no inquiry of note pending for standard mill forge. In basic, one inquiry for 5,000 to 10,000 tons is pending for fourth quarter for an eastern buyer who recently bought partially for this delivery. Some makers are now asking $16, delivered, for last quarter basic. Small sales of standard low phosphorus iron have been made on a basis equivalent to $20.50, delivered Philadelphia, which is a new high price by 25 cents for this grade. Several furnace changes have taken place in the eastern market and more seem likely, though makers are acting very slowly in increasing production. The Alburtis furnace of the Thomas Iron Co., a small stack, has resumed, and one of the furnaces of the Reading Iron Co. has gone out. The No. 2 Swedeland furnace has gone out and No. 3, a larger furnace, has blown in, which, with No. 1 active, leaves the plant at maximum production, since two of the stacks operate alternately.

We quote for prompt and last quar-

ter delivery to consumers' plants in Philadelphia and vicinity as follows:

Eastern Pa. No. 1X foundry	$15.75 to 16.00
Eastern Pa. No. 2X foundry	15.60 to 15.75
Eastern Pa. No. 2 plain	15.25 to 15.50
Standard gray forge	15.00 to 15.50
Basic (Eastern and Central Pa.)	15.50
Virginia No. 2X	16.05 to 16.30
Southern No. 2	15.50 to 15.75
Standard low phosphorus	20.25 to 20.50
Malleable	15.85 to 16.10

Coke.—Advances have been received by eastern sellers from several Connellsville coke operators to the effect that they are acting independent of any general movement to hold strictly for $2.50, ovens, for last half furnace coke. At about the time of this announcement, offers of 8,000 to 10,000 tons monthly of first class Connellsville coke were made by sellers to eastern furnacemen at $2.30, ovens. Eastern buyers have made several additional contracts for last half coke with West Virginia makers at $2, ovens. West Virginia coke takes the same freight to eastern Pennsylvania as the Latrobe district, or 20 cents less than from the Connellsville region.

Finished Materials.—With some eastern plants, there continues to be maintained a most satisfactory amount of new business. One important maker in the past week booked a tonnage twice as large as its capacity. Another plate mill is keeping up a record of bookings in excess of capacity and its deliveries are running back.

Prices show much firmness and advances continue. Suggestions have gone forth that further changes in the heavy lines may not be far distant and sales organizations are being enjoined to act carefully. Independent wire makers have out new schedules of $1 advance, effective July 20, following the lead of the American Steel & Wire Co. This advances nails to 1.65c, Pittsburgh, and common wire to 1.45c, Pittsburgh. Railroad spikes have been advanced $2 to 1.60c, Pittsburgh, and small spikes $3 to 1.65c, Pittsburgh, making a total advance of $5 a ton in the latter size in 45 days. Nuts and bolts are up again about $1 a ton, making large machine bolts 75 and 10 off. Eastern mills have advanced blue annealed sheets $1 a ton to 1.45c, Pittsburgh, for No. 10 gage, or 1.60c, Philadelphia, and report considerable business having been done at the new level. Some eastern mills are having little difficulty to book small shape orders for early deliveries, at 1.35c, Pittsburgh. In universal plates for quick shipment, premiums continue.

The United States Steel Products Co. is low and will receive 2,100 tons of fabricated material for the Panama canal. Dietrich Bros. have 400 tons for the Garrett building, Baltimore. F. T. Richardson & Son have the general contract for the Chamber of Commerce, Richmond, 500 tons, and Abel Bottoms & Son for the Y. M. C. A. on the west side, this city, 500 tons. The Reugers hotel project, Richmond, is again showing life. The Southern railroad will close this week on 700 freight cars, 41 steel coaches and 50 locomotives.

We quote, delivered to consumers' plants in Philadelphia and vicinity, as follows:

Plain structural shapes, 1.45c to 1.50c; tank plates, 1.45c to 1.50c; steel bars, 1.40c; common bar iron, 1.30c to 1.35c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage 1.60; 4 x 4-inch open-hearth rolling billets, $24.40; forging billets, $29.40 to $30.40. Extras shown under Pittsburgh report. Philadelphia warehouse prices 1.75c for plates, shapes and bars.

Old Material.—The heavy melting steel market in the east appears to be again approaching $14, delivered. Buying of this grade recently by one or two eastern Pennsylvania steel makers, previously referred to, is reported to have touched this level on a portion of the tonnage. Some consumers within the week were making offers for round lots at $14, delivered, but dealers showed no great eagerness to take any considerable tonnages on this basis.

We quote, gross tons, delivered to consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	14.75 to 15.25
No. 1 heavy melting steel	13.50 to 14.00
Old car wheels	13.75 to 14.25
Old iron axles	24.00 to 25.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	15.00 to 15.50
Wrought pipe	12.50 to 13.00
Cast borings	9.75 to 10.25
Machine shop turnings	10.75 to 11.25
Heavy cast	13.50 to 14.00
Malleable	11.75 to 12.25
Stove plate	10.75 to 11.25
No. 1 forge	12.00 to 12.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

BUFFALO

Pig Iron Shipments Heavy

Office of THE IRON TRADE REVIEW,
Buffalo, July 23.

Pig Iron.—All the furnaces in the district are holding firmly to the prices quoted in the accompanying table, despite the customary mid-summer lull in buying. The attitude of the furnaces is to accept only, at their figures, the slight tonnage remaining to fill their books for the balance of the year. Stocks are growing smaller and the specifications on contracts continue to come in in such volume that the furnaces are shipping iron as fast as it is made. The volume of specifying, if continued, will soon exceed the productive limit of the furnaces in blast.

The range of prices for the week, f. o. b. furnaces, is substantially as follows:

No. 1X foundry	$14.25 to 14.75
No. 2X foundry	14.25 to 14.50
No. 2 plain	14.00 to 14.25
No. 3 foundry	14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	15.75 to 17.50

Finished Material.—Prices are holding rigidly to the recent advances. The week has been marked by a greater number of inquiries, not on particularly large tonnages, but the aggregate of the scattered requirements desiring placement represents a heavy total and a decidedly healthy tone to the situation.

The Buffalo Structural Steel Co. was low bidder on the steel for the addition to the plant of the Crosby Co., Buffalo, requiring about 700 tons. It also received the contract on the Underwood building, Pearl and Erie streets, Buffalo, being erected by William H. Hitchkiss, requiring about 300 tons.

Bids will soon be taken for the new theater, Main street, Buffalo, to be erected by the Shea Amusement Co., requiring about 1,000 tons.

Rathbun & Co., Utica, are receiving figures on a new four-story and basement wholesale dry goods house, 100 x 140.

Old Material.—Lack of activity in the local yards again characterizes the week's transactions. On old car wheels the trend has been slightly downward.

We quote the following range as representing the prices for gross tons, f. o. b. Buffalo:

Heavy melting steel	$12.00 to 12.75
No. 1 railroad wrought scrap	12.75 to 13.50
No. 1 R. R. and mch. cast scrap	12.50 to 13.25
Old steel axles	21.00 to 22.00
Iron axles	21.00 to 22.00
Car wheels	12.50 to 13.00
Railroad malleable, scrap	11.50 to 12.25
Wr'ght iron and soft steel turn.	7.75 to 8.00
Cast iron borings	7.00 to 7.25
Low phosphorus steel scrap	15.75 to 16.00
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	12.75 to 13.25
Pipe and tank	9.50 to 10.00
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

NEW YORK

Increased Offerings of Cuban Ore

Office of THE IRON TRADE REVIEW, 1115 West Street Bldg., July 23.

Iron Ore.—The Spanish-American Iron Co. has been mining more ore than it needs for its own consumption and has recently made some sales of Daiquiri ore to eastern Pennsylvania furnaces at 7¼ cents per unit, f. o. b. cars Philadelphia. This ore is a Bessemer, semi-magnetite, is crushed to furnace size and analyzes approximately 59 per cent natural in iron, with phosphorus under 0.03. The Ponupo Manganese Co., another Cuban interest, has disposed of its entire output for this year to eastern merchant iron makers. The output from these several south coast Cuban operations is now running especially low in phosphorus and this is adding to the value of the ore as a merchantable material. Reports from abroad indicate a very strong condition of the ore freight market from Mediterranean ports.

Pig Iron.—Aside from the activities of several large eastern consumers who have been quietly sounding out conditions, on round lots of iron for delivery after the first of the year, the market has remained quiet. One of these buyers is on the point of closing with eastern makers for 15,000 to 20,000 tons. A Delaware river pipe maker has also been sounding the market on a round block of metal and has found furnaces very firm in their prices. A Bridgeport, Conn., consumer has practically closed for 1,000 tons of No. 1 for last quarter from an eastern maker. The market continues to manifest a very substantial degree of price strength. Eastern Pennsylvania No. 2X is quoted over the range of $14.75 to $15.50, furnace. Some Buffalo makers have advanced their schedules in the week 25 cents to $14.25, furnace, for No. 2X. The new Susquehanna No. 4 furnace in that territory is about to resume. We quote for prompt and last quarter shipment at New York tidewater as follows:

Northern foundry No. 1	$16.00 to 16.25
No. 2X foundry	15.50 to 16.00
No. 2 plain	14.75 to 15.00
No. 2 Virginia	16.05 to 16.30
No. 2 southern foundry	15.75 to 16.00
Malleable	15.75 to 16.00
Gray forge	15.00 to 15.25

Ferro-Alloys.—The active buying of ferro-manganese inaugurated a week or so ago has continued throughout the past week and from 8,000 to 10,000 tons of additional sales have been made largely for first half. Leading steel makers have been the principal buyers. For the greater part of this tonnage, English material will be furnished at $48.50, seaboard, as the offerings of German ferro-manganese at $47.50, seaboard, have now been generally eliminated. As a result of the active buying, several of the English makers are reluctant to accept additional business at the present price and all indications point to an early advance to $50 to $51, seaboard. Negotiations covering 3,000 to 4,000 tons are still pending. Other alloys are only fairly active. We quote standard English ferro-manganese at $48.50, seaboard, on contract and at $50, seaboard, for prompt delivery, and 50 per cent ferro-manganese at from $70 to $73, Pittsburgh.

Cast Iron Pipe.—Some diminution of the tonnage being entered by eastern pipe makers is apparent and this is due to the fact that while small pipe remains in strong demand, larger and heavier sizes are moving more slowly. The amount of new public work also coming out is lighter. The general condition in the market, however, is good, as makers are well filled with orders and prices have an upward tendency. We quote six inch pipe at from $22.00 to $23.00, f. o. b. New York in carload lots.

Finished Material.—New equipment buying by the railroads is featuring the market and a considerable portion of the new business in steel lines that is now moving is being derived from this source. The week has seen a more liberal buying of cars and locomotives by the railroads than for several months and this is but the forerunner of another buying movement of large proportions, as it is known that some of the larger systems, such as the New York Central, Harriman Lines, etc., are figuring on heavy expenditures along this line.

The principal car order placed in the week was by the Boston & Albany railroad, a part of the New York Central system, which awarded 5,300 box cars in addition to passenger equipment. The distribution of this order gives 3,000 box cars to the American Car & Foundry Co., 1,000 box cars to the Keith Car Mfg. Co., subsidiary of the Standard Steel Car Co., 800 general service cars to the Pressed Steel Car Co., 400 flat cars to the Standard Steel Car Co. and 100 ballast cars to the Rodgers Ballast Car Co. This road also bought 20 coaches from the American Car & Foundry Co., eight postals from the Laconia Car Co. and six diners from the Pullman Car Co. The Canadian-Pacific has divided an order for 2,000 box cars between the American Car & Foundry Co., and the Barney & Smith Car Co. The Denver & Rio Grande has placed 700 box cars with the Standard Steel Car Co., 350 general service cars with the Pressed Steel Car Co., 100 stock cars to the American Car & Foundry Co. and 50 cabooses to the Haskell & Barker Car Co. The Buffalo, Rochester & Pittsburgh has entered the market for 500 box cars, 500 gondolas, 100 automobile cars and 100 refrigerator cars. The Virginian and Southern railways are expected to close this week on 700 freight cars each. The Seaboard Air Line has placed 24 steel coaches with the Pressed Steel Car Co. and six diners with the Pullman Car Co. The New York Central is out for 25 motor passenger cars. In addition there is a heavy buying of locomotives. During the past week or 10 days, 300 to 400 locomotives have been placed.

Prices on finished products are generally very firm and premiums continue to be paid for quick shipments in some lines. Structural shapes for early shipment have sold in several cases at 1.35c, Pittsburgh. Universal plates are commanding premiums in the east. Steel bars are strong but not very active. Bar iron is stationary. In sheet bars, settlements with eastern consumers for August delivery have been made at $23.50, Pittsburgh, and makers are saying they would make no new sales at less than $24, but they have little, if any, tonnage to offer.

Structural lettings in the metropolitan district are rather light. The Hinkle Iron Works has 1,000 tons for

the Hall apartment at Ninety-second street and West End avenue, 300 tons for the Union Settlement building, East 104th street, and will furnish 600 tons additional on a second contract for the Meehan building, 163rd street and Southern boulevard, the complete requirement of which will now reach 1,200 tons; Levering & Gerrigues have 1,200 tons for the Baker & Williams loft, West Twentieth street, and the Eastern Steel Co. 300 tons for additions to the Seventh Regiment armory. The Fullerton Weaver apartment, Sixty-sixth street and Park avenue, 600 tons, has also been placed. While revised plans for the Eighth Artillery armory, this city, have not yet been issued, some of the steel mills have been asked to submit figures on the steel requirements probably to fix definite cost figures. No award is expected to result from these negotiations, however, as formal advertisements have not been issued. Bids have been entered on an office building at Atlanta, Ga., 1,000 tons.

We quote, delivered at New York tidewater, as follows:

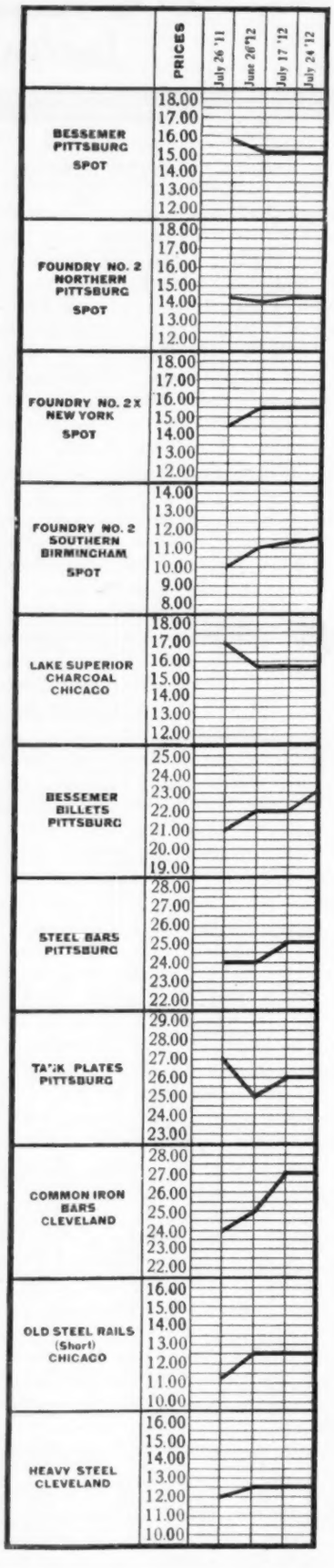
Plain structural shapes, 1.46c to 1.51c; tank plates, 1.46c to 1.51c; steel bars, 1.41c; common iron bars, 1.30c to 1.35c; steel bars from store, New York delivery, 1.85c; plates and shapes from store, 1.95c; extras as shown under Pittsburgh report.

Old Material.—The scrap market is fairly active. The most active grade has been heavy steel and quite a good tonnage of this material has been closed during the past several weeks, but there has been no general buying movement and purchases have been confined to one or two eastern Pennsylvania mills. Prices on steel scrap are firmer. Other grades are quietly moving with cast scrap remaining very dull. We quote, gross tons, prices New York dealers will pay, as follows:

Old car wheels	$11.75 to 12.00
Old iron axles	20.00 to 21.00
Steel axles	15.25 to 15.75
Old steel shafting	13.75 to 14.00
No. 1 heavy melting steel	11.25 to 11.50
No. 1 R. R. wrought	13.25 to 13.50
Wrought pipe	10.00 to 10.25
Cast borings	7.25 to 7.50
Machine shop turnings	8.25 to 8.50
Heavy cast	11.00 to 11.25
R. R. malleable	10.00 to 10.50
Stove plate	8.25 to 8.50
Grate bars	7.25 to 7.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.30 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark $1.10 from New York.

PRICE CHART



ST. LOUIS

Southern Iron Firm

Office of THE IRON TRADE REVIEW,
St. Louis, July 23.

Pig Iron.—While not quite so active as last week, the pig iron market in the St. Louis territory is satisfactory, inquiries aggregating about 2,500 tons, including a lot of 1,000 tons of mixed grades. Prices are ruling firm at $11.50 to $12 for southern No. 2, Birmingham, with some business being closed at the higher figure. One inquiry for 800 tons of southern No. 2 for delivery over the first quarter was refused by a local sales agent for the reason that he is not making prices for that shipment. Sales made the latter part of last week included 1,000 tons of high manganese for last half delivery, 1,000 tons of northern, 1,000 tons of southern, 500 tons of Nos. 3 and 4 southern, and 6,000 tons of southern and malleable. Northern iron continues firm at $13 to $13.50, Ironton. Our tabulated prices on southern iron, delivered, to which the Birmingham freight of $3.75 a ton has been added, follow:

Southern No. 1	$15.50 to 16.00
Southern No. 2	15.00 to 15.60
Southern No. 3	14.50 to 15.00
Southern No. 4	14.00 to 14.50

Coke.—There is little inquiry for coke and sales are limited to small lots for early delivery.

We quote 72-hour Connellsville foundry grades, $2.60 to $2.75 for immediate shipment or delivery through the year; 48-hour Connellsville furnace, $2.25 to $2.40; best 72-hour Virginia foundry, $2.50 to $2.75; 48-hour Virginia furnace, $2.25 to $2.40. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—At least three hotels, any one of which would require a considerable tonnage of steel, are in contemplation, and it is not unlikely that two of them will be built in the near future. Bids have been made on the steel to be used in the new Monward building to be erected at Broadway and Olive street. The building will be 18 stories high, with a central tower extending several stories above the roof.

Steel bars are quoted at 1.25c, Pittsburgh, and specifications against contracts are heavy. Steel plates and structural are in good demand at

1.30c, Pittsburgh. Spikes have been advanced from 1.50c to 1.60c, Pittsburgh.

Old Material.—Prices that dealers are willing to pay for scrap iron, f. o. b. St. Louis, remain unchanged as follows:

Gross Tons

Old car wheels	$13.50 to 14.25
Old iron rails	15.25 to 15.50
Re-rolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.25 to 13.25
Light section relayers (45 lb. and under) subject to inspec.	21.50 to 22.50
Relaying rails, subject to inspec.	22.50 to 23.25
Frogs, switches and guards	9.50 to 10.25
Heavy melting steel	10.50 to 11.25
Shoveling steel	9.75 to 10.25

Net Tons

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.25 to 13.50
Knuckles, couplers and springs	9.50 to 10.00
Shafting	13.00 to 13.50
Iron car axles	17.50 to 18.00
Steel car axles	15.00 to 15.50
Locomotive tires	10.50 to 11.00
No. 1 country wrought	8.75 to 9.25
Pipe and flues	8.00 to 8.50
Tank iron and cut boilers	7.00 to 7.50
No. 1 cut busheling	8.75 to 9.25
No. 2 cut busheling	5.75 to 6.25
Cast and mixed borings	5.75 to 6.00
Machine shop turnings	6.50 to 6.75
Railroad malleable	10.00 to 10.50
Agricultural, malleable	9.00 to 9.50
Stove plates	9.00 to 9.50
Angle splice bars (iron)	10.75 to 11.50
Angle splice bars (steel)	9.00 to 9.50

BIRMINGHAM

Southern No. 2 Scarce at $12

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., July 24.

Pig Iron.—The schedule of asking prices is practically established on a basis of $12, Birmingham, for delivery the remainder of the year. This quotation is being made by all of the leading producers, and there is no disposition to shade in order to increase sales for spot shipment. An aggregate of 2,500 tons of different grades was reported sold this week at a slight concession from the established basis, but the nature of this particular transaction was out of the ordinary. The largest of recent sales involved 400 tons, each, of Nos. 2 and 4 foundry for delivery in the last quarter. This iron was sold on the $12 basis. One or more round tonnage lots for forward delivery were submitted during the week, but the trade generally manifested a disposition to await further developments before increasing the tonnage engaged. One of the largest inquiries was received from a large eastern manufacturer for 2,500 tons of gray forge. An additional stack was blown in on foundry iron during the past week, making a total of 20 stacks in operation on coke, with two stacks in operation on charcoal. Quotations on the several grades, for delivery in the remainder of the year, are as follows, per gross ton, f. o. b. cars, Birmingham district furnaces:

For delivery during the remainder of the year:

No. 1 foundry	$12.50
No. 2 foundry	$11.50 to 12.00
No. 3 foundry	11.00 to 11.50
No. 4 foundry	10.50 to 11.00
Gray forge	10.25 to 10.75
Mottled	10.00 to 10.25
Standard basic	10.75 to 11.25
Off basic	10.50 to 10.75
Standard charcoal	22.50 to 23.00

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked over the above figures for deliveries in the last quarter.

Cast Iron Pipe.—An addition of 2,500 tons has just been made to local order books by specifications for water pipe on contracts previously entered along the Pacific coast, to which is added a very satisfactory volume of small orders. The movement is now somewhat in excess of the output, and the producing interests are not keen for additional business. Asking prices are being maintained for the business offered, and in line with the strengthening of pig iron prices, there is a tendency to advance, especially on small lots. Quotations on water pipe are as follows, per net ton, f. o. b. cars: Four-inch, $23.50; 6-inch and up, $21.50, with $1 per ton extra for gas pipe.

Old Material.—The demand for all steel grades has slackened and prices have been affected accordingly. Light cast and machinery grades continue in heavy demand, which is also true of wrought, and miscellaneous railroad scrap. A considerable tonnage of the latter has been placed on local yards recently. In certain instances, the prices recently offered for steel scrap were too low to be considered. We quote dealers' prices, per gross ton, f. o. b. cars:

Old iron axles (light)	$15.50 to 16.00
Old steel axles (light)	12.00 to 12.50
Old iron rails	12.00 to 12.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.50 to 11.00
No. 1 country	8.50 to 9.00
No. 2 country	6.50 to 7.00
No. 1 machinery	9.00 to 9.50
No. 1 steel	9.50 to 10.00
Tram car wheels	8.50 to 9.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	7.00 to 7.50

METAL MARKETS

Bullish Sentiment In Copper

New York

New York, July 23.

Tin.—The tin markets of the past week have been lacking in any feature of unusual interest. Consumers have been normally active buyers, and arrivals have been quite plentiful to meet demands. The metal was depressed to around 43c, July 17, but improvement in price has taken place since that date and spot and July closed today at 43.75c. August tin is offered at 43.60c. Estimates of deliveries into consumption during the current month average close to 4,800 tons. Since July 1, 4,466 tons have been delivered at Atlantic ports, and it is probable that the total arrivals for the month will reach 5,000 tons. There are 1,609 tons afloat.

The London market declined to £197 for spot and £195 for three months, July 17, but recovered toward the end of the week, 16-23, and closed today at £199 5s and £196 15s respectively.

Copper.—Sentiment in the copper trade has become bullish again, and higher prices than have yet been made since the market turned last year are talked of. The supplies that were held in second hands early in the month have been absorbed by consumers, and producers have booked considerable business during the past few days. It is estimated that between 9,000,000 and 10,000,000 pounds of metal has been contracted for at around 17.75c since the supplies from second hands were exhausted. Electrolytic is firm at 17.75c, delivered 30 days; lake is 17.75c, cash, and castings is 17.37½c.

Chicago

Chicago, July 22.

New Metals.—Although there seems to be no falling off in demand spelter and lead are a little weaker. Copper, however, continues to advance, being quoted 17⅛c as against 17c last week.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 17¼c; casting, 17¼c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 7.10c to 7.15c; lead, desilverized, 3.35c in 50-ton lots; corroding, 4.70c; sheet zinc, 8.75c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 43.70c; Cookson's antimony, 8½c; other grades, 7½c to 8c.

New Members of the Iron and Steel Institute

Complete List of Those Recently Enrolled in This Great American Organization of the Iron and Steel Industry

The following is a complete authentic list of the names and addresses of the new members who have recently been elected by the American Iron and Steel Institute.

Anson W. Allen, superintendent open-hearth department, Tennessee Coal, Iron & Railroad Co., Birmingham.

Alonzo F. Allen, secretary and assistant treasurer, American Steel & Wire Co., Chicago.

Thomas P. Alder, treasurer, United States Steel Products Co., New York.

Harry L. Austin, J. Brooks Fenno & Co., Pittsburgh.

Franklin E. Abbott, chief inspecting engineer, Lackawanna Steel Co., Buffalo.

Chas. L. Allen, general manager and secretary, Norton Co., Worcester, Mass.

Taylor Allderice, second vice president, National Tube Co., Pittsburgh.

Eliot Armstrong, assistant to general manager sales, Lackawanna Steel Co., Buffalo.

E. M. Byers, manufacturer iron pipe, Pittsburgh.

Russel D. Budd, manager wire department, United States Steel Products Co., New York.

Chas. Edward Buck, manufacturer pig iron, 1103 Chestnut street, Chattanooga.

B. F. Bourne, president, Bourne-Fuller Co., Cleveland.

Adolphe E. Borie, vice president, Taylor Iron & Steel Co., New York.

Chas. W. Bennett, assistant to president, American Sheet & Tin Plate Co., Pittsburgh.

Addison H. Beale, manager, Vandergrift United American Sheet & Tin Plate Co., Vandergrift, Pa.

Daniel Nichols Bates, traffic manager, American Sheet & Wire Co., Worcester, Mass.

Edwin Ball, general superintendent, mining department, Tennessee Coal, Iron & Railroad Co., Birmingham.

Wm. H. Baldridge, vice president and eastern sales manager, Phillips Sheet & Tin Plate Co., New York.

Chas. W. Baird, secretary and treasurer, Detroit Iron & Steel Co., Detroit.

Webster R. Balsinger, assistant to president, Carnegie Steel Co., Pittsburgh.

Jacob C. Barrett, superintendent blast furnaces, Carnegie Steel Co., Ohio Works, Youngstown.

Louis C. Biehler, traffic manager, Carnegie Steel Co., Pittsburgh.

Ernst Boley, assistant to general superintendent, American Steel & Wire Co., Cleveland.

James B. Bonner, manager of sales, Carnegie Steel Co., Philadelphia.

Edwin Corner Brown, chief civil engineer, Carnegie Steel Co., Pittsburgh.

Chas. J. Barr, general superintendent, Ensley division, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Daniel M. Buck, chemist and metallurgist, American Sheet & Tin Plate Co., Pittsburgh.

A. F. Banks, president, Elgin, Joliet & Eastern Railway Co., Chicago.

H. H. Barbour, New York sales agent, Lackawanna Steel Co., New York.

Quincy Bent, assistant to president, Maryland Steel Co., Sparrows Point, Md.

Talmadge Blass, superintendent coke department, Lackawanna Steel Co., Buffalo.

L. E. Block, vice president, Inland Steel Co., Chicago.

Wm. Breeman, district sales manager, Lackawanna Steel Co., Philadelphia.

Hazen Brown, assistant superintendent, Lackawanna Steel Co., Buffalo.

C. W. Bryan, chief engineer, American Bridge Co., New York.

I. T. Burden Jr., New York.

Frank H. Burnett, general purchasing agent, Lackawanna Steel Co., Buffalo.

Levi H. Burnett, assistant to president, Carnegie Steel Co., Pittsburgh.

Allerton S. Cushman, director, Institute of Industrial Research, Washington, D. C.

Robert B. Carnahan, vice president, American Rolling Mill Co., Middletown, O.

Louis J. Campbell, assistant to president, Youngstown Sheet & Tube Co., Youngstown, O.

Frank D. Carney, general superintendent, Pennsylvania Steel Co., Steelton, Pa.

Walter C. Carroll, assistant general manager sales, American Sheet & Tin Plate Co., Pittsburgh.

David B. Carse, director, Lehigh Coke Co., New York City.

John C. Chandler, district sales agent, Lackawanna Steel Co., Cleveland.

Eugene B. Clark, vice president, American Sintering Co., Chicago.

Wm. H. Connell, treasurer, American Bridge Co. of New York, Pittsburgh.

Wm. Gray Clyde, assistant general manager sales, Carnegie Steel Co., Pittsburgh.

John A. Coakley, division freight agent, American Steel & Wire Co., Cleveland.

John P. Collins, assistant general superintendent, Lucy furnace, Carnegie Steel Co., Pittsburgh.

Wm. R. Conrad, assistant treasurer, Carnegie Steel Co., Pittsburgh.

Chas. L. Cordes, division freight agent, American Steel & Wire Co., Pittsburgh.

Alfred A. Corey Jr., assistant general superintendent, Homestead works, Carnegie Steel Co, Munhall, Pa.

Silas H. Cummings, manager tin plate department, United States Steel Products Co., New York City.

Samuel W. Croxton, retired iron manufacturer, Cleveland.

Frank Hearne Crockard, vice president, Tennessee Coal, Iron & Railroad Co., Birmingham.

E. R. Crawford, president, McKeesport Tin Plate Co., McKeesport, Pa.

Willeby T. Corbett, manager rail department, United States Steel Products Co., New York City.

S. H. Chauvenet, general manager, Berkshire Iron Co., Sheridan, Pa.

Henry A. Carpenter, vice president, Riter-Conley Mfg. Co., Pittsburgh.

Augustus W. Carey, traffic manager, Tennessee Coal, Iron & Railroad Co., Birmingham.

John Maurice Callen, assistant general manager, Reading Iron Co., Reading, Pa.

Arthur L. Davis, division contracting manager, American Bridge Co. of New York, New York.

Geo. E. Day, secretary and general manager, Youngstown Sheet & Tube Co., Youngstown, O.

Jas. W. Dietrick, general manager operating departments, Republic Iron & Steel Co., Youngstown, O.

Martin J. Dowling, assistant manager, Jones & Laughlin Steel Co., Pittsburgh.

L. L. Driggs, New York agent, United Steel Co., New York City.

Henry J. Davis, general superintendent, Clairton Steel Works, Carnegie Steel Co., Clairton, Pa.

Wm. Owen Davis, division freight agent, American Steel & Wire Co., Chicago.

Friedel D. Day, freight claim agent, American Steel & Wire Co., Chicago.

Montrose S. Dennis, purchasing agent, American Sheet & Tin Plate Co., Pittsburgh.

Ambrose N. Diehl, superintendent blast furnaces, Carnegie Steel Co., Duquesne, Pa.

Chas. E. Dinkey, general superintendent, Edgar Thomson Works, Carnegie Steel Co., Bessemer, Pa.

Chas. I. Dailey, assistant to general superintendent, American Sheet & Wire Co., Pittsburgh.

Geo. Damerel, sales agent, American Tube & Stamping Co., New York City.

Geo. F. Davis, vice president, Interstate Iron & Steel Co., Chicago.

Geo. C. Davies, sales manager, foundry iron department, Pilling & Crane, Philadelphia.

Thos. W. Dawson, assistant chief engineer, H. C. Frick Coke Co., Scottdale, Pa.

Bradley Dewey, chief, research laboratory, American Sheet & Tin Plate Co., Pittsburgh.

Daniel J. Driscoll, president, Delaware Seamless Tube Co., Auburn, Pa.

Geo. P. Early, special agent, American Sheet & Tin Plate Co., Pittsburgh.

J. H. Edwards, chief engineer, American Bridge Co. of New York, New York City.

Wm. H. Eaton, sales manager, Chicago.

H. Cole Estep, associate editor, The Iron Trade Review, Chicago.

Chas. T. Fairbairn, manager southern district, Republic Iron & Steel Co., Birmingham.

Walter P. Fedder, manager, order department, United States Steel Products Co., New York City.

Jas. H. Foster, president, Hydraulic Pressed Steel Co., Cleveland.

Stanton S. Freeman, blast furnace manager, Carbon Iron & Steel Co., Ltd., Parryville, Pa.

Fred M. Fuller, assistant general manager of sales, American Sheet & Tin Plate Co., Pittsburgh.

H. A. Fuller, president, Upson Nut Co., Cleveland.

Geo. C. Foote, director, Witherbee, Sherman & Co., Port Henry, N. Y.

Dudley G. Gautier, New York City.

Frederick F. Graham, secretary, Lackawanna Steel Co., Buffalo.

Wm. B. Gresham, manager Lorain department, United States Steel Products Co., New York City.

Leslie J. Gray, assistant to general superintendent, American Steel & Wire Co., Pittsburgh.

Augustus B. Grange, assistant special agent, American Sheet & Tin Plate Co., Pittsburgh.

Walter H. Glasgow, assistant to general superintendent, H. C. Frick Coke Co., Scottdale, Pa.

Jas. H. Grose, superintendent Ohio Works, Carnegie Steel Co., Youngstown, O.

Howard Main Gassman, electrical engineer,

Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Hardy Greenwood, sales agent, Iron & Steel, Dallas, Texas.

Walter E. Hadley, assistant superintendent blast furnaces, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Edw. J. Hamilton, assistant general superintendent, Duquesne Works, Carnegie Steel Co., Duquesne, Pa.

O. J. H. Hartsuff, superintendent New Castle Works, Carnegie Steel Co., New Castle, Pa.

Herbert P. Howell, assistant to vice president, Carnegie Steel Co., Pittsburgh.

I. Lamont Hughes, superintendent Youngstown district bar mill departments, Carnegie Steel Co., Youngstown, O.

Azor R. Hunt, general superintendent, Homestead Works, Carnegie Steel Co., Munhall, Pa.

Storm B. Haarbye, assistant chief engineer, American Sheet & Tin Plate Co., Pittsburgh.

Geo. F. D. Hallman, purchasing agent, Reading Iron Co., Reading, Pa.

Geo. W. Hannan, general manager, Phillips Sheet & Tin Plate Co., Weirton, W. Va.

John M. Hansen, president, Standard Steel Car Co., Pittsburgh.

Jas. L. Hastings, district purchasing agent, American Steel & Wire Co., Chicago.

F. A. Heitman, president, F. W. Heitman Co., Houston, Texas.

John H. Hearding, assistant general manager, Oliver Iron Mining Co., Duluth.

Edw. L. Herndon, treasurer, Eastern Steel Co., Pottsville, Pa.

Carroll O. Holmes, manager, structural and plate department, United States Steel Products Co., New York.

John Hughes, general agent, United States Steel Products Co., New York City.

Geo. A. Hunter, steam engineer, American Sheet & Tin Plate Co., Pittsburgh.

Wm. E. Hyatt, manager New York City department, United States Steel Products Co., New York City.

Guy A. Hagar, district sales manager, Lackawanna Steel Co., Buffalo.

Samuel Hale, vice president, Wisconsin Steel Co., Chicago.

Francis J. Hall, general sales agent, Central Iron & Steel Co., Harrisburg, Pa.

Lyman J. Hench, assistant to district sales manager, Lackawanna Steel Co., Chicago.

J. P. Higginson, treasurer, Lackawanna Steel Co., Buffalo, N. Y.

Cecil H. Hobbs, assistant district sales manager, Lackawanna Steel Co., Chicago.

Francis E. House, president, Duluth & Iron Range Railroad, Duluth, Minn.

Otis E. Hovey, assistant chief engineer, American Bridge Co., New York City.

W. Earl Howes, traffic manager, Lackawanna Steel Co., Buffalo, N. Y.

Elton Hoyt 2nd, Pickands, Mather & Co., Cleveland.

Robert B. Hufnagel, general superintendent, Jones & Laughlin Steel Co., Pittsburgh.

Hughes, John, General agent, United States Steel Products Co., New York City.

Frederick Ingraham, superintendent, Rockdale works, American Steel & Wire Co., Joliet, Ill.

Joseph E. Johnson Jr., manager, Lake Superior Iron & Chemical Co., Ashland, Wis.

Isaac W. Jenks, general manager bar and hoop division, Carnegie Steel Co., Pittsburgh.

Henry L. Jones, manager, South American department, U. S. Steel Products Co., New York City.

Robert E. Jennings, president, Carpenter Steel Co., New York City.

Geo. S. Jenks, manager order department, American Sheet & Tin Plate Co., Pittsburgh.

Ward J. Jacobs, president, Shelby Iron Co., Hartford, Conn.

Chas. T. Johnston, general manager sales, Republic Iron & Steel Co., Youngstown.

Robert B. Kernohan, assistant to general manager, Jones & Laughlin Steel Co., Pittsburgh.

G. Cook Kimball, chief engineer, American Sheet & Tin Plate Co., Pittsburgh.

John P. Kessler Jr., general agent, Carnegie Steel Co., Pittsburgh.

John F. Lewis, assistant general superintendent Edgar Thomson works, Carnegie Steel Co., Bessemer, Pa.

Karl L. Landgrebe, superintendent blast furnaces, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Eugene Guy Lilly, assistant superintendent of open-hearth department, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Chas. W. Lutz, superintendent Birmingham works, American Steel & Wire Co., Birmingham.

Silas J. Llewellyn, president, Interstate Iron & Steel Co., Chicago.

Jas. S. Llewellyn, production manager, Chicago Malleable Castings Co., West Pullman, Ill.

Wm. H. Lewis, general superintendent, Aliquippa works, Jones & Laughlin Steel Co., Woodlawn, Pa.

John G. Lehman, vice president and general manager, Bethlehem Foundry & Machine Co., South Bethlehem, Pa.

Geo. M. Laughlin Jr., manager Soho works, Jones & Laughlin Steel Co., Pittsburgh, Pa.

Robert P. Lamont, president, American Steel Foundries, Chicago.

C. G. Laeson, assistant chief engineer, American Bridge Co. of New York, New York City.

Arthur H. Lee, superintendent blast furnaces, Lackawanna Steel Co., Buffalo.

Geo. K. Leet, secretary to chairman, United States Steel Corporation, New York City.

Wilson A. Luce, assistant general manager, Ellsworth Collieries Co., Ellsworth, Pa.

Wm. A. McGonnagle, president, Duluth, Missabi & Northern Railroad, Duluth.

Jay C. McLauchlan, district sales manager, Lackawanna Steel Co., Detroit.

Wm. McLauchlan, Pickands, Mather & Co., Cleveland.

Dilworth B. McClelland, vice president and treasurer, Spang, Chalfant & Co., Pittsburgh.

Archibald M. McCrea, president, Union Spring & Manufacturing Co., New York City.

John H. McLean, general manager, Oliver Iron Mining Co., Duluth.

Wm. C. McCausland, treasurer, Carnegie Steel Co., Pittsburgh.

John Wm. McGrady, manager producing department, Homestead works, Carnegie Steel Co., Munhall, Pa.

John McLeod, assistant to president, Carnegie Steel Co., Pittsburgh.

James B. McKippips, assistant auditor, Carnegie Steel Co., Pittsburgh.

Andrew E. Maccoun, superintendent Edgar Thomson blast furnaces, Carnegie Steel Co., Braddock, Pa.

Carl E. Maeder, superintendent, Bessemer rolling mills, Tennessee Coal, Iron & Railroad Co., Bessemer, Ala.

Jas. R. Mills, manager of sales, Carnegie Steel Co., New Orleans, La.

J. A. Mohr, superintendent Carrie furnaces, Carnegie Steel Co., Rankin, Pa.

Augustus F. Mack, freight agent, United States Steel Products Co., New York.

Geo. Matheson Jr., general manager, Spang, Chalfant & Co., Pittsburgh.

D. A. Merriman, assistant general sales agent, American Steel & Wire Co., Chicago.

Frederick Meyers, manager tube department, United States Steel Products Co., New York City.

Harrison S. Morris, president, Wharton Steel Co., Philadelphia.

Geo. E. Molleson, manager railway department, Tyler Tube & Pipe Co., New York City.

August Mann, superintendent Anderson works, American Steel & Wire Co., Anderson, Ind.

Orville A. Marsteller, superintendent converting and mixing department, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Wm. G. Mathias, assistant general superintendent Ensley works, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

Simon S. Martin, superintendent Maryland Steel Co., Sparrows Point, Md.

Amasa S. Mather, Pickands, Mather & Co., Cleveland.

Samuel L. Mather, assistant secretary, Cleveland-Cliffs Iron Co., Cleveland.

David L. Mekeel, chief engineer, Jones & Laughlin Steel Co., Pittsburgh.

Leigh B. Morrison, district sales manager, Cambria Steel Co., New York City.

John B. Moss, assistant manager, American Steel & Wire Co., Worcester, Mass.

W. P. Murray, Pickands, Mather & Co., Cleveland.

Thomas Murray, assistant secretary, United States Steel Corporation, New York City.

John C. Neale, assistant general manager of sales, Carnegie Steel Co., Pittsburgh.

Albert L. Nash, New York City.

L. F. Nagle, general sales agent, Worth Bros. Co., Coatesville, Pa.

John H. Nicholson, second vice president, Shelby Steel Tube Co., Pittsburgh.

Wm. J. Olcott, Oliver Iron Mining Co., Duluth, Minn.

Geo. A. Pendergast, sales department, Lackawanna Steel Co., New York City.

Henry S. Pickands, Pickands, Mather & Co., Cleveland.

Peter C. Patterson, chief engineer, National Tube Co., Pittsburgh.

Arthur C. Parsons, chief chemist, Lackawanna Steel Co., Buffalo.

Louis R. Putnam, treasurer and general manager, Ashland Steel Co., Ashland, Ky.

Arthur Piper, chief inspector American Sheet & Tin Plate Co., Pittsburgh.

Andrew Pinkerton, electrical engineer, American Sheet & Tin Plate Co., Pittsburgh.

Chas. W. Pike, Lackawanna Steel Co., district sales manager, San Francisco.

Robert L. Parrish, president Oriskany Ore & Iron Co., Covington, Va.

Bertram D. Quarrie, general superintendent Newburgh Steel Works & Furnaces, Newburgh, Ohio.

Geo. F. Rummel, assistant general sales agent, American Steel & Wire Co., Chicago.

Lewis P. Ross, blast furnace manager, Northern Iron Co., Standish, N. Y.

S. M. Rodgers, metallurgist, American Steel & Wire Co., Pittsburgh.

C. F. W. Rys, metallurgical engineer, Carnegie Steel Co., Pittsburgh.

H. C. Ryding, assistant to vice president, Tennessee Coal, Iron & Railroad Co., Birmingham.

Harry L. Rownd, vice president and treasurer, Republic Iron & Steel Co., Youngstown.

Alex. P. Robinson, vice president, Cambria Steel Co., Philadelphia.

Morton C. Robbins, manager, The Iron Age, New York City.

Henry A. Raymond, Cleveland-Cliffs Iron Co., Cleveland.

John M. Sias, assistant to vice president, United States Steel Corporation, New York City.

Jas. Sim, New York City.

Edwin E. Slick, chief mechanical engineer, Carnegie Steel Co., Pittsburgh.

Geo. Smart, editor, Iron Trade Review, Cleveland.

Geo. W. Smith, Lackawanna Steel Co., Buffalo.

Edw. B. Stearns, assistant division contract-

ing engineer, American Bridge Co., New York City.

F. N. Speller, metallurgical engineer, National Tube Co., Pittsburgh.

A. Starke, manager order department, Lackawanna Steel Co., Buffalo.

Jas. L. Stephenson, president, Cincinnati Iron & Steel Co., Cincinnati.

Harold L. Stevens, district sales manager, Lackawanna Steel Co., Boston, Mass.

Harry L. Schotter, general superintendent, City mills, Carnegie Steel Co., Pittsburgh.

Jas. Scott, general superintendent Isabella and Lucy furnaces, Carnegie Steel Co., Pittsburgh.

John R. Scott, general manager sales, Carnegie Steel Co., Cleveland.

Robert Skemp, assistant to vice president, American Sheet & Tin Plate Co., Pittsburgh.

Walter F. Schleiter, vice chairman and secretary, Dilworth, Porter & Co., Pittsburgh.

Geo. W. Sells, superintendent, American Steel & Wire Co., Waukegan, Ill.

Jesse J. Shuman, inspecting engineer, South Side works, Jones & Laughlin Steel Co., Pittsburgh.

Walter C. Stone, assistant manager wire mills, American Steel & Wire Co., Chicago.

Armin A. Schlesinger, Iron Ore Mining & Iron Manufacturer, Milwaukee.

Henry J. Schlesinger, Iron Ore Mining & Iron Manufacturer, Milwaukee.

Ferdinand Schlesinger, Iron Ore Mining & Iron Manufacturer, Milwaukee.

Geo. C. Scott, manager Asiatic department, United States Steel Products Co., New York City.

Geo. L. Shook, manager blast furnace, Northern Iron Ore, Port Henry, N. Y.

Malcom D. Sloane, secretary, Eastern Steel Co., New York City.

James W. Smith, manager, Trenton Iron Co., Trenton, N. J.

Wm. H. Stratton, manager bridge department, United States Steel Products Co., New York City.

Geo. M. Sullivan, manager sheet steel department, United States Steel Products Co., New York City.

Noah H. Swayne 2d, manager of sales, Rogers, Brown & Co., Philadelphia.

Geo. D. Swift, assistant secretary, Oliver Iron Mining Co., Duluth.

Knox Taylor, president, Taylor Iron & Steel Co., High Bridge, N. J.

Thos. D. Temple, superintendent, American Steel & Wire Co., DeKalb, Ill.

Benjamin H. Taylor, special agent, Carnegie Steel Co., Pittsburgh.

James M. Taylor, purchasing agent, Carnegie Steel Co., Pittsburgh.

Howard C. Toomey, president, Philadelphia Steel & Wire Co., Philadelphia.

David P. Thompson, president, Sharpsville Furnace Co., Cleveland.

Leon E. Thomas, general manager, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Rowland D. Thomas, president, Davies & Thomas Foundry Co., Catasauqua, Pa.

Elmer M. Tewkesbury, general superintendent, South Buffalo Railway Co., Buffalo.

Thomas H. Taylor, assistant general sales agent, American Steel & Wire Co., New York City.

Dr. John S. Unger, manager research laboratory, Carnegie Steel Co., Duquesne, Pa.

Chas. A. Vogt, auditor, American Steel & Wire Co., Cleveland.

Felix A. Vogel, general manager, Florence Iron Co., New York City.

Arthur P. Van Schaick, district sales manager, Lackawanna Steel Co., Chicago.

J. E. Wadsworth, resident engineer, American Bridge Co., New York City.

Geo. B. Waterhouse, metallurgical engineer, Lackawanna Steel Co., Buffalo.

Richard Wayland-Smith, assistant manager sales, Carnegie Steel Co., New York City.

Samuel T. Wellman, chairman, Wellman, Seaver, Morgan Co., Cleveland.

Frank A. Wilmot, metallurgical engineer and manufacturer, Bridgeport, Conn.

Elmer E. Winckler, assistant manager sales, American Sheet & Tin Plate Co., New York City.

Walter C. Witherbee, treasurer and director, Witherbee, Sherman & Co., Port Henry, N. Y.

Wm. L. Wolfe, superintendent blast furnaces, Lackawanna Iron & Steel Co., Lebanon, Pa.

Edw. Worcester, first vice president, National Tube Co., Pittsburgh.

Fred L. Watson, treasurer, American Steel & Wire Co., Chicago.

Ralph H. Watson, superintendent openhearth department, Homestead works, Carnegie Steel Co., Munhall, Pa.

Wm. Whigham, assistant to president, Carnegie Steel Co., Pittsburgh.

Reubens S. White, credit manager, American Steel & Wire Co., Chicago.

Frank J. Whitgrove, superintendent, Scott street works, American Steel & Wire Co., Joliet, Ill.

J. Waldeck, superintendent North works, American Steel & Wire Co., Worcester, Mass.

David M. Weir, vice president, Phillips Sheet & Tin Plate Co., Weirton, W. Va.

Seymour Wheeler, assistant secretary, Pickands, Brown & Co., Chicago.

Samuel H. Whitaker, assistant to managing director, Dayton Coal & Iron Co., Cincinnati.

G. Arthur White, metallurgist, American Sheet & Tin Plate Co., Pitsburgh.

Horace S. Wilkinson, president, Halcomb Steel Co., Syracuse, N. Y.

Edw. P. Williams, superintendent foundry blast furnaces, Tennessee Coal, Iron & Railroad Co., Bessemer, Ala.

Leonard G. Woods, vice president, Union Spring & Mfg. Co., Pittsburgh.

Philip E. Wright, sales agent, Thomas Iron Co., Philadelphia.

Wilfred L. Wright, vice president and general manager, Tioga Steel Co., Philadelphia.

Andrew G. Young, traffic manager, American Sheet & Tin Plate Co., Pittsburgh.

BRASS PLANT

Of Bethlehem Steel Co. Will be Enlarged—Other Improvements.

The Bethlehem Steel Co., South Bethlehem, Pa., is completing arrangements to enlarge its brass foundry. The enlarged foundry will be 110 x 240 feet and will contain 19 furnaces, each having a capacity of 700 pounds per heat, thus giving the plant a daily capacity of 26,600 pounds of brass castings. The present furnaces, which are of the round type, will be discarded and replaced by new furnaces, of the square type. The new furnaces will be so designed that they can produce a maximum of 1,000 pounds per heat when desired. In order to make room for the proposed addition to the brass foundry, the present gray iron pattern shop will be moved to another location.

The Didier-March Co. has now completed the first battery of 300 by-product coke ovens at the Saucon plant of the Bethlehem Steel Co.

HEAVY BUYING

Of Locomotives by Railroads—Details of Recent Orders.

Buying of motive power equipment by the railroads has been especially active during the past several weeks and some large orders have been placed. Contracts closed during the past week or ten days aggregate from 300 to 400 locomotives. The Southern Railway Co. has placed 10 superheater passenger locomotives, six consolidation freight locomotives and four switching locomotives with the American Locomotive Co. and was in the market for 30 mikado locomotives, in addition, the distribution of which has not been announced. The New York Central system is buying liberally and has placed orders for 100 locomotives, which includes 21 for the Boston & Albany, awarded to the American Locomotive Co., 22 for the Michigan Central, including 12 to the American Locomotive Co. and 10 to the Lima Locomotive Corporation and 50 of the mikado type for other affiliated lines with the Baldwin Locomotive Works. The Illinois Central has closed for 50 mikado locomotives with the Baldwin Locomotive Works and has given an additional order of 10 switchers to the American Locomotive Co. Recently, as reported, it also placed 20 Pacific locomotives with the latter company. The Erie has ordered 30 mikado locomotives from the American Locomotive Co., 15 from the Baldwin works and five from the Lima Locomotive Corporation. The Grand Trunk railroad has given the Baldwin Locomotive works an order for 19 locomotives. The distribution of the St. Paul order recently announced includes 50 mikado and six Mallet locomotives, placed with the American Locomotive Co. The Minneapolis & St. Louis railway has placed 10 consolidation freight locomotives with the American Locomotive Co.

In the July issue of the IRON TRADE REVIEW, page 110, it was announced that Frank R. Blaurock & Son have been appointed district sales agents for the Andrews Steel Co. and the Newport Rolling Mill Co., Newport, Ky. This statement was erroneous, as Frank R. Blaurock & Son are representatives of the Andrews Steel Co. and the Newport Rolling Mill Co. is represented in Chicago by Theo. Geissmann & Co.

The Utilization of Electric Power for Iron Mining-I

Developments of the Cleveland-Cliffs Iron Co. on the Marquette Range—Description of the Carp River Hydro-Electric Project

The question of power cost in the operation of mines in the Lake Superior district is a factor of constantly growing importance, particularly in view of the growth of the size of the plant necessary to mine ore successfully in this region. The economy of electric power over steam already has been demonstrated and as there are plenty of streams throughout the Lake Superior mining district for the development of hydro-electric plants, it is not surprising that the use of electricity for the operation of mining equipment is making rapid progress. The Cleveland Cliffs Iron Co. has gone farther than any of its contemporaries in the use of electric power for mining operation. A large power station has been built at Marquette, Mich., with transmission lines to its mines at Ishpeming, Negaunee, North Lake and on the Swanzy range. Fourteen of the company's 18 principal mines are equipped to some extent, at least, with electrical apparatus and the seven new mines will be operated exclusively by electric power.

In the early days of iron mining the cost of power was given practically no attention. During the past 20 years, however, the iron ore industry has grown to enormous proportions and with this growth has come a decline in the price of ore and a constantly diminishing margin between the cost of production and the selling price of the product. At the same time it has been found necessary to utilize the less desirable ore beds and to mine at greater depth than would have been considered feasible in the early days of the industry.

With the growth in the size of the plant necessary to successfully mine iron ore, the question of power cost has gradually become one of importance until today it is a subject that is receiving careful study by all of the prominent mine operators of the country.

Although the investigations are still in their incipient stages, enough data have been collected to show that the ordinary method of producing power by means of isolated steam plants burning coal, which has to be transported long distances, is too expensive for economical results under modern conditions. The solution of the problem, for the present at least, seems to lie in the substitution of electricity developed by water power.

Cost of Fuel

In most mining regions there are plenty of streams with considerable flow and suitable head for the development of hydro-electric plants which can generate power very cheaply. The average mine plant operated by steam cannot produce a kilowatt-hour on much less than 4½ pounds of coal. With ordinary run of mine coal, costing $3.50 a ton delivered at the mine, the fuel cost of the generation of power by steam is $0.0079 per kilowatt-hour and the total cost is approximately 1 cent per kilowatt-hour under good conditions. A properly constructed hydro-electric plant will deliver current to motors over a transmission line 50 miles or less in length at from $0.006 to $0.007 per kilowatt-hour. The economy of the electric power over steam is self-evident from these figures. It is, therefore, not surprising that the use of electricity is making rapid progress in the iron mining districts of Lake Superior.

A mining company considering the employment of electric power must, of course, take account of the large amount of additional capital necessary for such development and must be in a position to raise considerable sums of money. Also the loss in the replacement of existing serviceable

The description of the electrical developments of the Cleveland-Cliffs Iron Co. on the Marquette range will be concluded in the next issue of THE IRON TRADE REVIEW. The article to be published next week will dwell particularly on the application of electric power in iron mining operations with special reference to electric hoisting.

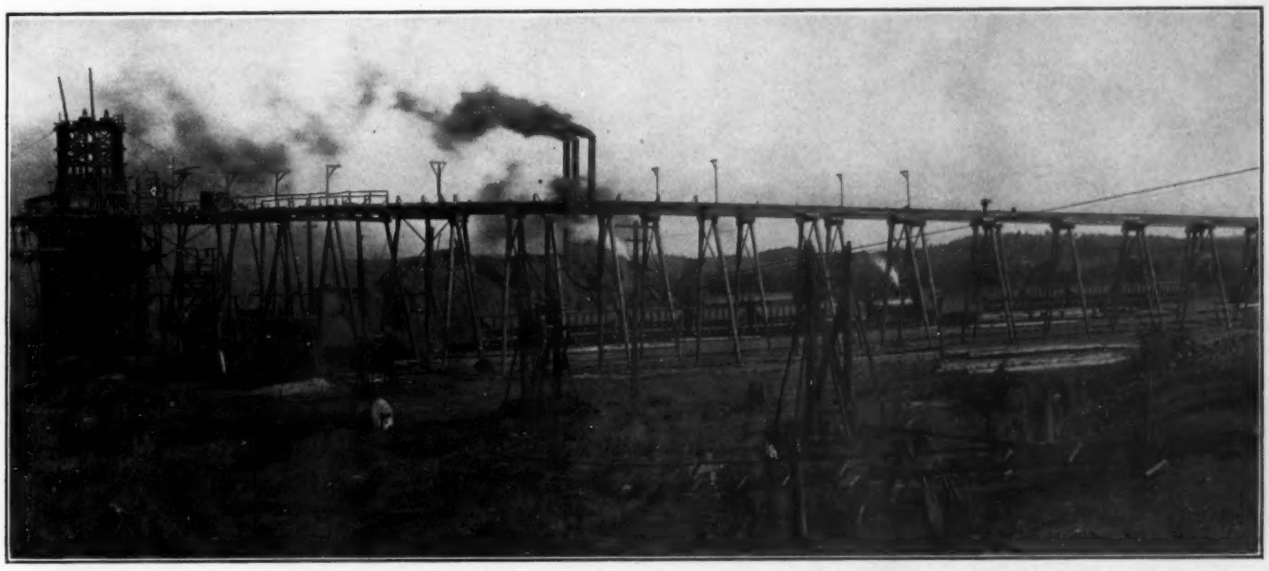


FIG. 1—OLD NO. 2 SHAFT AT THE NEGAUNEE MINE, SHOWING THE TYPE OF EQUIPMENT REPLACED BY STEEL CONSTRUCTION AND ELECTRIC-DRIVEN MACHINERY

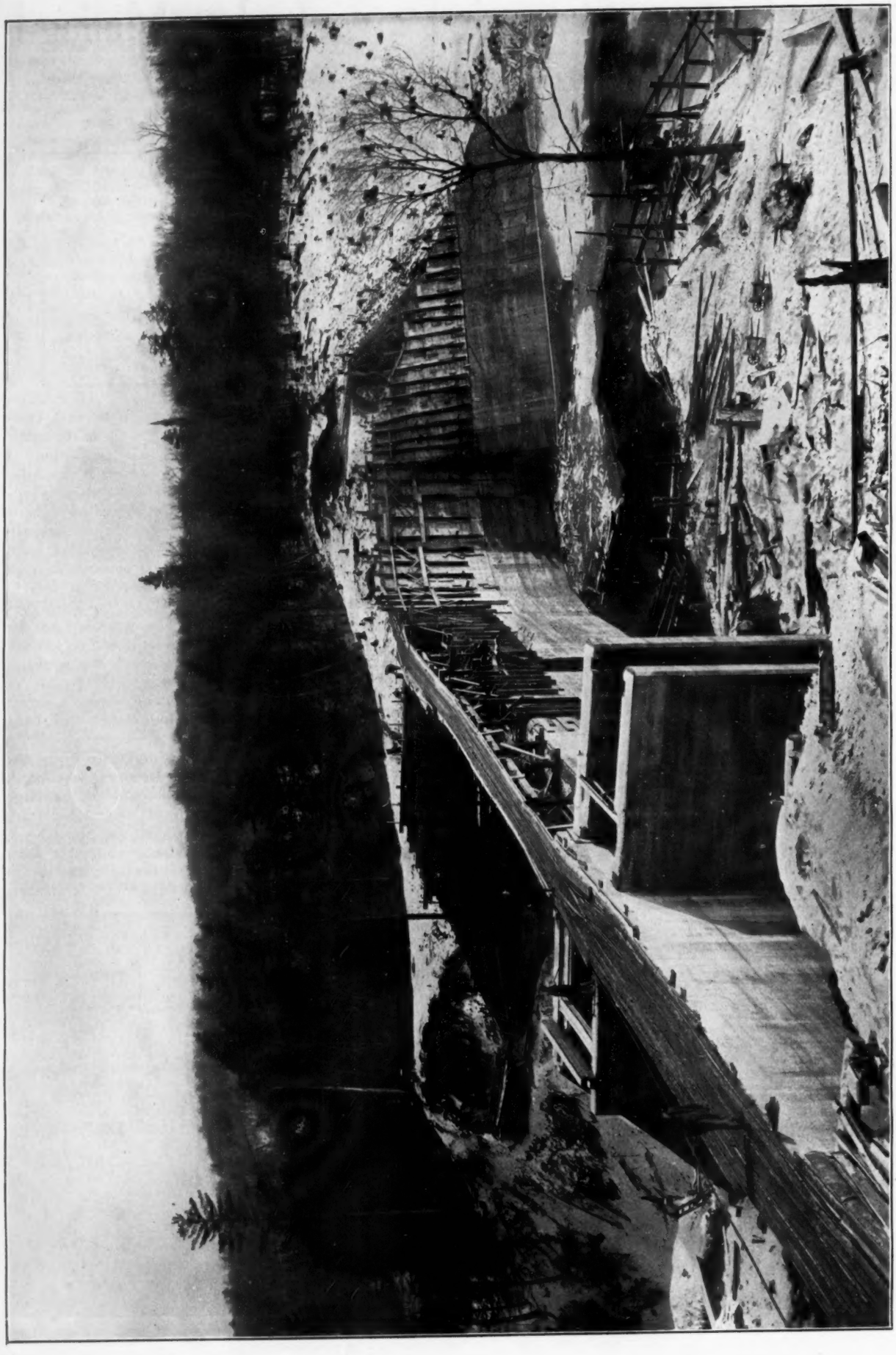


FIG. 2—VIEW OF THE CARP RIVER DAM WHILE UNDER CONSTRUCTION

steam equipment must be given consideration. In fact, it is due to this latter factor that electric power has not been more generally and rapidly adopted. Even the largest mining companies which have gone farthest in electrical development have found it expedient to make the substitution from steam to electricity gradually.

The Cleveland-Cliffs Iron Co., which is second only in importance in the Lake Superior district to the Oliver Iron Mining Co., controlled by the United States Steel Corporation, has gone farther than any of its contemporaries in the use of electric power for mining operations. This company has built a large power station near Marquette, Mich., together with transmission lines to its mines at Ishpeming, Negaunee, North Lake and on the Swanzy range. A large sum has been invested in the project and at present, out of 18 principal mines which are being operated or developed by the company, 14 are equipped to some extent at least with electrical apparatus and the new mines, seven in number will be operated exclusively by electric power. Electricity has been substituted for steam completely at the Negaunee mine and in only a slightly less degree at the other more important properties of the company. Fig. 3 shows the general layout of the Cleveland-Cliffs Iron Co.'s electrical development. The generating station, which now has a normal rated capacity of 5,000 kilowatts, is located on the north bank of the Carp river, near Lake Superior, about two miles south of the city of Marquette. The dam is situated approximately three miles up stream from the power plant and is connected thereto by a pipe, 21,000 feet in length. The main transmission line extends westerly from the power plant to the Brownstone sub-station at Ishpeming, a distance of approximately 14 miles. From this point a branch leads four miles further west to the new mines in the North Lake district and another branch extends 17 miles southeast to a sub-station at Princeton. There is also a sub-station at the Maas mine near Negaunee. The maximum distance over which the current will be transmitted is, therefore, 31 miles from the power station to the sub-station at Princeton. A branch transmission line connects the main line with the blast furnace plant of the Pioneer Iron Co. at Marquette. Active work on the project commenced Feb. 20, 1911, and power was turned on in the completed plant Feb. 16, 1912. The system was laid out and constructed under the general direction of the officials of the Cleveland-Cliffs Iron Co., at Ishpeming, together with the advice of Viele, Blackwell & Buck, consulting engineers, New York.

Preliminary investigations showed that the drainage area of the river is about 80 square miles, the average flow in a dry month being 0.4 cubic feet per second per square mile of drainage area, or 32 cubic feet per second in all. This flow is higher than that of other northern Michigan streams on account of the water pumped from mines and the drainage from the cities of Ishpeming and Negaunee; the increased flow due to these causes amounts to approximately 0.1 cubic foot per second per square mile of drainage area. The Carp river contains more water than it is practicable to use during six months of the year and the plant is designed to utilize such a flow as could be depended upon during seven months of the year. In the periods of low water and peak load, auxiliary steam plants at the Maas mine and at Princeton lend assistance to the hydro-electric plant.

Observations were made extending over a period of 48 months and the stream discharge was found to be 1.25 second-feet per square mile during seven months of the year when the flow is largest. The equipment was proportioned on the basis of this flow, which for the total drainage area amounts to 100 second-feet. The hydraulic apparatus was designed for a maximum discharge during high water of 152 second-feet. This established the load factor of the plant at the ratio of 100 to 152 or 66 per cent.

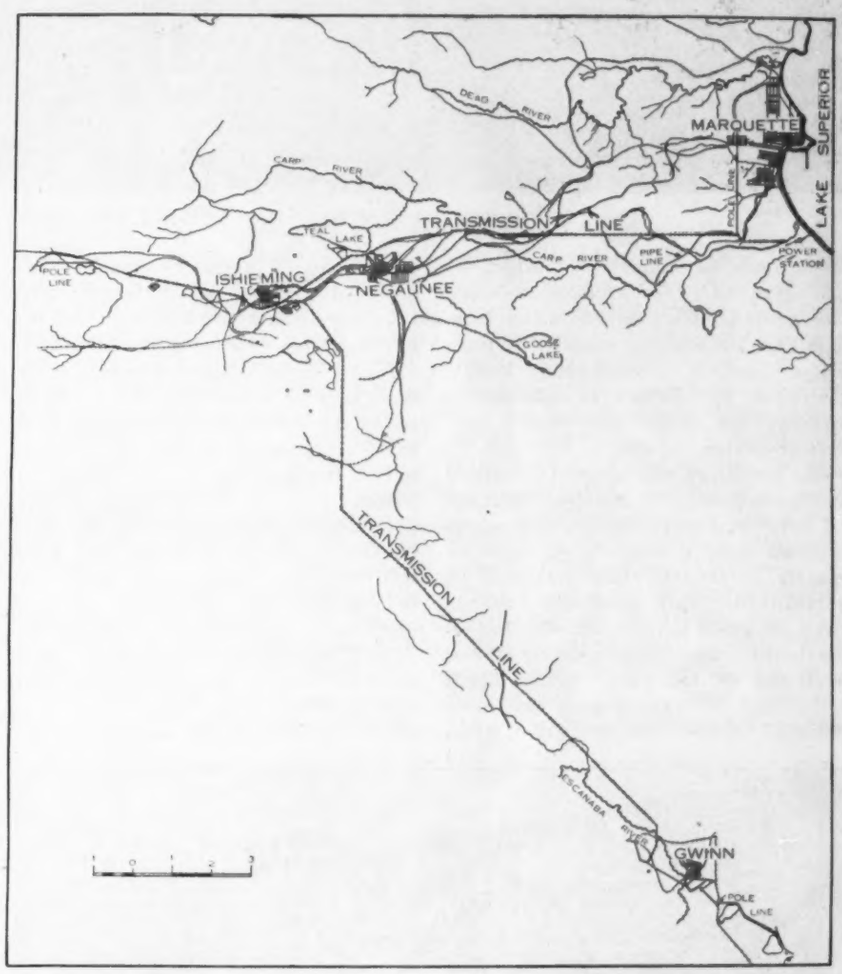


FIG. 3—MAP OF THE CLEVELAND-CLIFFS IRON CO.'S HYDRO-ELECTRIC SYSTEM, SHOWING THE CARP RIVER WATER POWER TRANSMISSION LINES, ETC.

The total fall between the dam and the power station is 600 feet and the average working head 580 feet, thus giving 1,680 horsepower with 32 second-feet stream discharge. Transmission losses are approximately 15 per cent. On a basis of 100 second-feet stream discharge, 5,250 horsepower could be generated continuously and a peak load of 6,000 horsepower would be available at the Ishpeming sub-station. During the year it is estimated that 26,500,000 kilowatt-

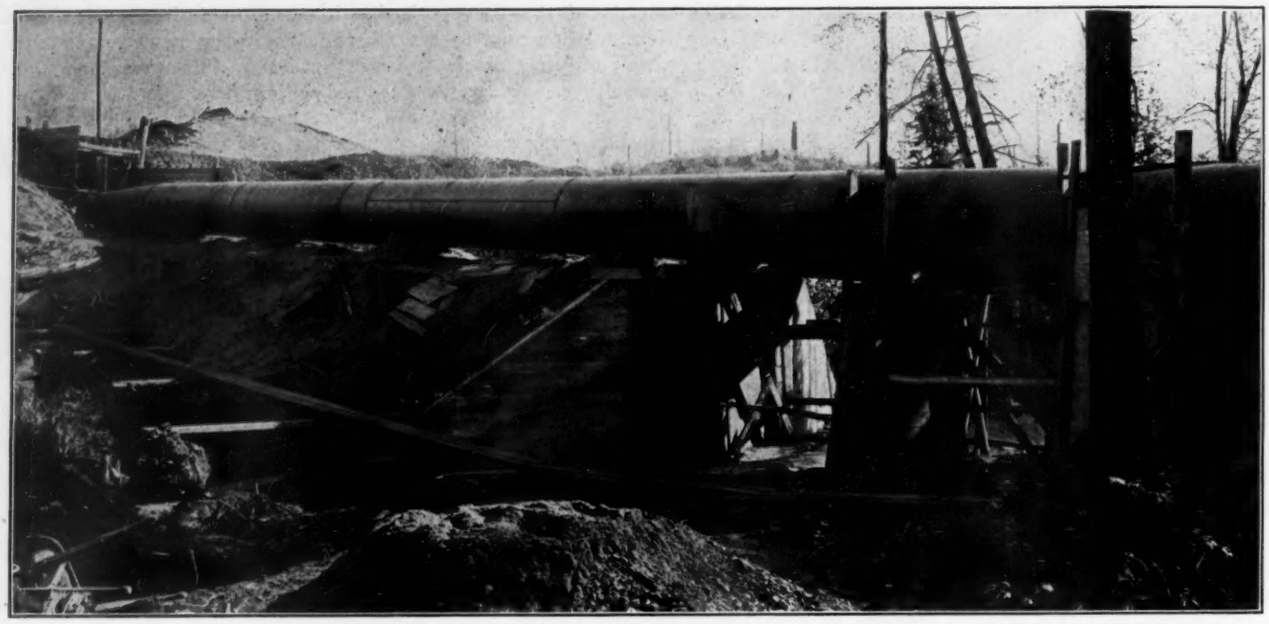


FIG. 4—LOCK BAR STEEL PIPE CROSSING THE LITTLE CARP RIVER

hours will be required, of which 15 per cent, or 4,000,000 kilowatt-hours, are to be supplied by the steam auxiliaries. The storage capacity at present amounts to approximately 10,000,000 cubic feet, which is sufficient to average the daily and weekly discharge of the stream.

To cut down the amount of steam power necessary, a storage site north of Ishpeming has been selected where a pond with a capacity of approximately 275,000,000 cubic feet will be established. This pond will have an area of 1,000 acres and will be retained by a dam approximately 20 feet high and 300 feet long. When this is completed it is estimated that only 1,300,000 kilowatt-hours of steam power will be necessary annually instead of 4,000,000 kilowatt-hours and the steam plant capacity can be reduced 50 per cent to 1,500 kilowatts.

Fig. 2 shows a general view of the dam under construction. Fig. 5 illustrates the details of the spill-way section of the dam and Fig. 11 is a detail of the pipe line connection at the intake. The retaining walls of the dam are of special design, one embankment being constructed with core wall anchors, behind which is an extensive back fill. A gravel pit was discovered immediately adjoining the dam site, of which advantage was taken in mixing concrete. The dam may be briefly described as consisting of a concrete retaining section and in take on the north bank, 125 feet in length, with a concrete spillway section, 120 feet long, and a concrete retaining section, 120 feet long, on the south bank. The top of the spillway section is 52 feet above the river bed. With 3-foot flashboards on the crest of the dam, a pond one mile long, 32 acres in extent, is created. As shown in Fig. 11, the intake connecting with the pipe line consists of a thimble, 72 inches in diameter, extending through the dam and terminating in a shut-off valve on the downstream side. The latter is connected to the 60-inch wood pipe by another conical steel thimble or coupling. The intake is also provided with 12-inch vent pipe.

FIG. 5—SPILLWAY SECTION OF THE CARP RIVER DAM

The Pipe Line

The pipe line connecting the dam with the generating station includes many interesting features. It consists of 10,000 feet of 60-inch wood pipe similar to that shown in Fig. 8 and 9,000 feet of 60 and 66-inch lock bar steel pipe similar to that shown in Fig. 4, together with 2,000 feet of seamless, welded, high pressure pipe. The wood pipe is used at all points where the head does not exceed 170 feet; the lock bar pipe where the head exceeds that figure, and over crossings down to the surge tank. From the surge tank to the generating station, a distance of 2,000 feet, the high pressure welded pipe is used. The wood pipe was furnished by the Pacific Coast Pipe Co., Seattle, Wash., and consists of clear fir staves banded by steel rods, as indicated in Fig. 8. This illustration also shows in detail one of the air relief valves placed along the pipe line.

FIG. 6—STEEL PIPE LINE, SHOWING CONCRETE ANCHORAGES

The pipe is laid through a rough country. In order that it may be retained in place it is provided with heavy concrete anchorages similar to the one shown in Fig. 6. This illustration also shows clearly the character of the country through which the pipe line extends. The territory traversed by the pipe is not provided with roads and in order to avoid the construction of one for handling the material, an ingenious plan was devised. At two points the pipe line crosses the tracks of the Duluth, South Shore & Atlantic railroad, and the material was delivered at these crossings. A track was laid in the trench which had been dug for the pipe. The material for the line was hauled over this track, using small tram cars and teams, as indicated in Fig. 10. The track was removed as the pipe was completed. The lock-bar pipe was made by the East Jersey Pipe Co., New York City. It possesses a longitudinal joint between the plates, so formed that a minimum resistance is offered to the flow of the water. It is usually made in 30-foot lengths and compared with riveted steel pipe, is said to show from 10 to 20 per cent less resistance. The form of joint in this pipe is clearly indicated in Fig. 4. The sections of pipe taper slightly so that the small end fits into the end of the next section. The circumferential joint is riveted and caulked.

Lock Bar Pipe

In specifications covering lock bar pipe, issued by the East Jersey Pipe Co., it is stipulated that each section shall be tested in a hydraulic testing machine to at least 1½ times the working pressure. This pressure shall be maintained until an inspection has been made of the entire length of the lock bar joint. The pipe section, heated to the proper temperature, is then put vertically into a bath of mineral rubber and when removed has a protecting layer, 1/32-inch in thickness, covering the metal. The rubber bath is maintained at a temperature of about 350 degrees Fahr. In manufacturing the pipe the longitudinal edges of the plate are planed to the proper size and then upset enough to form the necessary shoulder for engaging the lock bar. The plates, after being clamped to the proper radius for the pipe, are assembled in the lock bars, which are then pressed down over the upset edges of the plates by a hydraulic press operating at a pressure of 350 tons or more per lineal foot of pipe.

The high pressure seamless welded pipe was imported from Germany and delivered on the ground at a cost less than that of American riveted pipe sufficiently strong for the same pressure. The imported pipe was manufactured by Thyssen & Co., Mulheim, a. d. Ruhr, Germany.

The construction of this pipe is especially interesting. It is made with a flare at the end so that the rivet heads are out of the line of flow when the pipe is put together. All the holes are drilled and marked for an

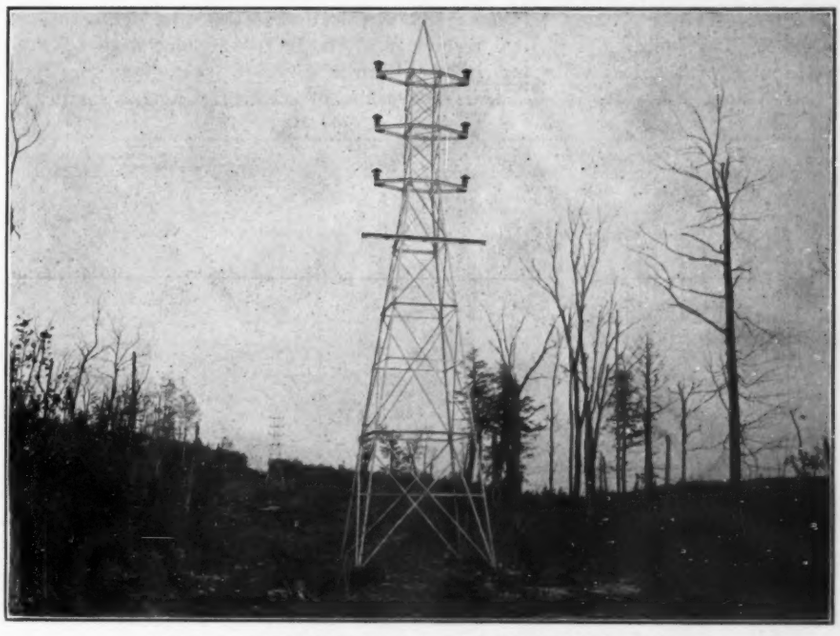


FIG. 7—STEEL TOWERS FOR TRANSMISSION LINE

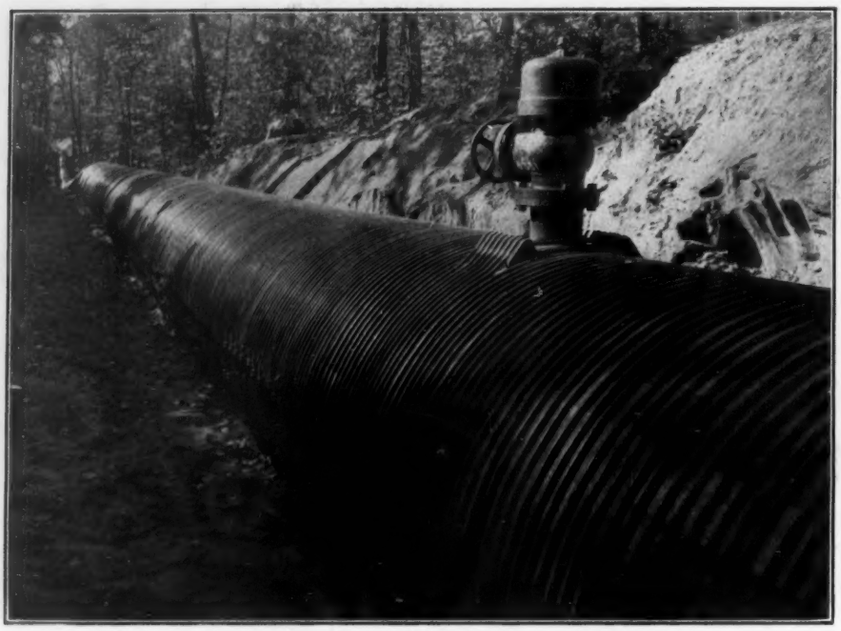


FIG. 8—WOOD STAVE PIPE BANDED WITH STEEL BARS

exact fit. The number and size of rivets in a pipe of this nature are sufficient to introduce an appreciable amount of friction if the heads obtrude into the flow of the water. The longitudinal seams in the pipe are welded. Thyssen & Co. claim that the pipe is about 30 per cent stronger than riveted pipe with the same thickness of plate. The weight of the pipe is, therefore, less than the weight of riveted pipe of the same strength. Since the pipe has no longitudinal seams, it cannot develop leaks through the stresses created in handling it during transportation or laying.

Arrangement of Power Station

The general arrangement of the Carp river power station is shown in Fig. 9. The building is a steel frame structure with brick walls and is entirely fireproof. It is 87 feet in length and 47 feet in width. The turbines and generators were furnished by the Allis-Chalmers Co., Milwaukee. Two 4,000 horsepower single, horizontal, hydraulic turbines, each direct-connected to a 2,500-kilowatt Allis-Chalmers generator are installed. The turbines have cast iron spiral casings and are designed for 550 feet effective head. The normal speed is 720 revolutions per minute and normal capacity, 3,200 brake-horsepower. Each turbine has a maximum capacity of 4,000 brake-horsepower. The runner is bronze cast in one piece and keyed to a forged steel shaft. The thrust rings are turned out of the solid shaft. The cast iron casing is made in the form of a true evolutionary spiral so that the area decreases proportionally to the discharge of water into the guide case, resulting in a constant velocity of flow and minimum losses. The runner and guide case may be removed without taking the machine from its foundation. The turbine is provided with two ring oil bearings; one is on a pedestal and the other is carried as a cantilever. The machine is balanced hydraulically so that the thrust due to the action of the runner is automatically counteracted. This is accomplished by proportioning the annular spaces on opposite sides of the runner so that any longitudinal displacement of the shaft causes a throttling of the small flow through the clearance spaces on one side and a relief of pressure on the other. As a result the rotor is kept in its proper position. The flywheel, which is placed between the turbine and the generator, is cast steel, 5½ feet in diameter. Each turbine is provided with a cast steel inlet pipe tapering from 32 inches in diameter at the valve flange to 42 inches at the inlet flange. It is approximately 7 feet long. A 36-inch hand-operated wicket valve is installed. The draft-tubes are approximately 20 feet long and 40 inches average diameter. They are built of ¼-inch steel plate. They are tapered so as to reduce the velocity of the water leaving the runner. The water is discharged into a tail race which has been excavated for a distance of 1,600 feet to the river bed.

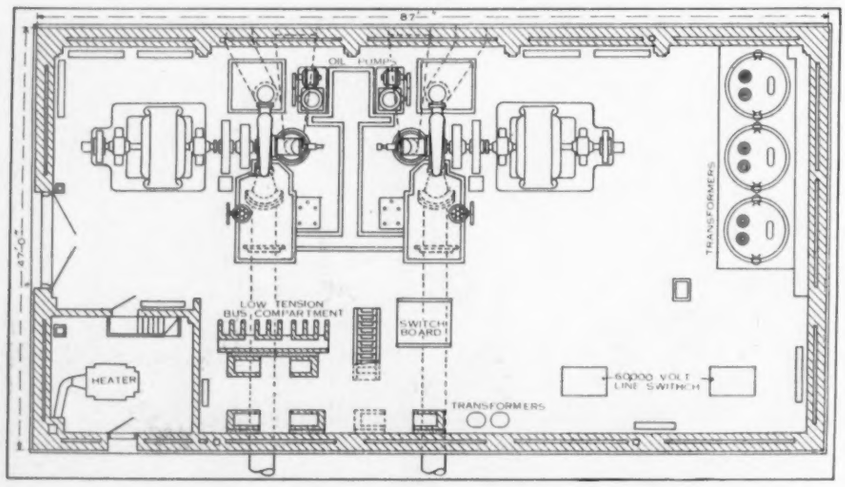


FIG. 9—PLAN OF THE CARP RIVER POWER STATION

How the Units are Controlled

Each unit is controlled by a governor-actuated pressure regulator, operated with oil pressure. This mechanism was designed for a maximum discharge capacity of 3.75 second-feet per unit at one foot head, or 90 second-feet at 580 feet head. The pressure increase is arranged not to exceed 12 per cent for sudden decreases of load amounting to 4,000 brake-horsepower or less. The maximum designed increase in pressure is 30 pounds. Specifications for the machine provide for regulation within the following limits:

Load change, horsepower	Speed variation, per cent	
	Load on.	Load off.
2,000	8.0	5.5
1,500	6.0	4.0
1,000	4.0	2.5
500	2.2	1.5

The oil pressure system for the governors consists of rotary oil pumps driven by induction motors. The motors are 15-horsepower capacity and operate on 110-volt circuits, the pumps having a discharge of approximately 60 gallons of solid oil per minute. A receiving tank and a pressure tank designed for 250 pounds per square inch are provided.

Provision is also made so that the governor may be mechanically-controlled by a small motor operated from the switchboard and also by hand.

Each generator unit is equipped with a synchronizing attachment consisting of a 115-volt, direct current motor geared to the relay hand wheel.

The generators, which together with all of the electrical equipment were furnished by the Allis-Chalmers Co., are 2,800 kilovolt-amperes capacity each. They operate at 720 revolutions per minute, delivering 2,300-volt, 60-cycle, 3-phase current. The generators are of the revolving field type, equipped with 10 poles and weigh approximately 70,000 pounds. Each generator is provided with a direct coupled 125-volt, 200-ampere, direct current exciter. The exciters are designed to deliver their maximum output of 200 amperes when the generators are yielding a maximum current of 702 amperes per terminal. The generator field winding consists of copper strips wound on edge and insulated from the core for 1,500 volts alternating current. The capacity of the insulation is determined by a test of one minute duration on a non-inductive load. The generator efficiency at full load is specified to be 96 per cent, dropping to 93 per cent at half load and 87 per cent at quarter load. The specified efficiency of the plant as a whole is as follows:

Kilowatts at switchboard.	Compound efficiency, per cent.	Water consumption, cubic feet per second.
2,800	79.6	76.0
2,100	79.4	57.2
1,400	73.4	41.3

For stepping up the current to line voltage, three single-phase, 1,900-kilovolt-ampere, water-cooled transformers are installed. The primary windings are for 2,300 volts and the secondaries are adjustable for either 30,000 or 60,000 volts, 60 cycles. At present the line voltage is 30,000. The transformers are delta connected. Each unit is approximately 114 inches high and 82 inches in diameter. The weight of the transformer proper is approximately 15,000 pounds. The weight of the case is 7,000 pounds and of the oil 11,200 pounds. Each unit is designed to require 6.7 gallons of cooling water per minute and has a specified efficiency of 96.5 per cent at quarter load and 98.5 per cent at full load. The iron loss is specified to be 17,400 watts and the copper loss, 12,600 watts.

The auxiliary equipment, as shown in Fig. 9, includes two 60,000 volt oil line switches, a switchboard, auxiliary transformers and a low tension bus compartment. The switchboard is provided with standard modern remote control apparatus. It consists of three panels, one for the exciters, one for the feeders and synchronizer and the third for the generators, transformers and feeders. There are also two lightning arrester equipments. The main generator field-rheostats are located in a gallery above the switchboard and are controlled by motors from the generator panel. They may also be operated by hand. A Tirrell voltage regulator, manufactured by the General Electric Co., is provided. The circuit breakers are equipped with a relay which sets an electric alarm in action the instant the circuit is interrupted. The power house is equipped with a 20-ton Niles traveling crane.

FIG. 10—TRANSMISSION TRACK IN PIPE TRENCH USED FOR DISTRIBUTING CONSTRUCTION MATERIAL

The general layout of the transmission line is shown in Fig. 3 and the details of the steel towers are illustrated in Fig. 7. The brush is cleared from the transmission line right-of-way and large trees adjacent to the line which might be dangerous have been removed. Special care has been taken to reinforce the structure at railroad crossings and other important points. In order to avoid interruptions two complete 3-phase circuits have been erected, one circuit being carried on each side of the steel towers. The details of the transmis-

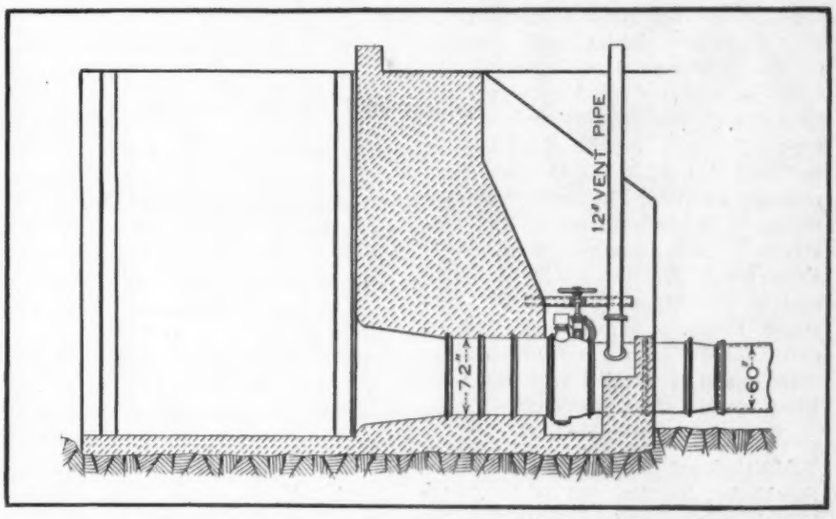


FIG. 11—DETAIL OF THE MAIN PIPE LINE CONNECTION AT THE DAM

sion line towers are clearly shown in Fig. 7. The tips of the towers are connected by a heavy strain wire and the telephone line is carried underneath the high tension wires. At the Brownstone sub-station at Ishpeming, two Allis-Chalmers transformers are installed.

As previously stated the hydraulic power is supplemented by steam plants at the Maas mine and at Princeton. The equipment at the former consists of a 2,300-volt, 295-ampere, 3-phase, 60-cycle, 1,800 revolutions per minute, Allis-Chalmers, Parsons turbo-generator, together with the necessary auxiliaries. The generating unit is rated at 1,000 kilowatts. The field of the main generator is excited by a motor generator set comprising a 33½-horsepower, 2,-200-volt, 850 revolutions per minute, induction motor and a 120-volt, 187½-ampere, direct current generator. The turbine exhausts into a Tomlinson jet condenser. The condenser auxiliaries include an 8 x 16 x 20-inch steam driven high vacuum pump, an 8-inch high speed Allis-Chalmers, centrifugal injection pump direct-connected to a 25-horsepower, 3-phase, 60-cycle, 220-volt, 850 revolutions per minute motor and a 10-inch high speed centrifugal Allis-Chalmers circulating pump direct-connected to a 2,300-volt, 850 revolutions per minute, 40-horsepower motor.

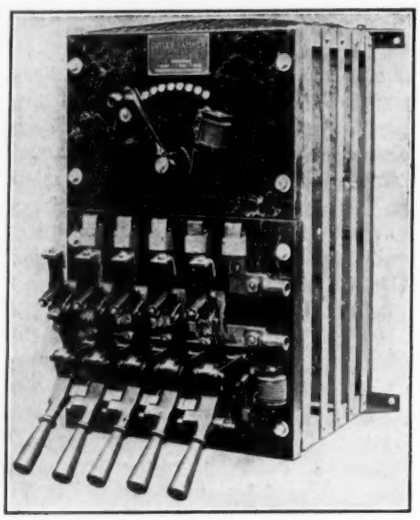
Steam is supplied by four 350-horsepower, Sterling water tube boilers equipped with Murphy stokers. Coal hoppers are situated over the boilers. The boiler plant is provided with a Sturtevant economizer and operates with an induced draft.

In addition to furnishing steam to the turbo-generator unit, the boiler plant is also connected to a 4,800-cubic foot, Sullivan cross-compound air compressor and to two steam-driven hoists. The cage hoist is operated by a 14 x 24-inch duplex high pressure engine. The rope drum is cylindrical, 6 feet in diameter and 8 feet long, the hoist being of the second motion type. The first motion skip hoist is operated by a 20 x 48 inch high pressure engine. The drum is 8 feet in diameter and 8 feet long. The electric generating equipment at Princeton is practically a duplicate of that at the Maas mine. These two steam plants, comprising an aggregate of 2,000 kilowatts capacity, may be operated in parallel with the Carp River station when necessary.

Aktiebolaget Axel Christiernsson, Stockholm, Sweden, has established a branch office for the sale of foundry equipment and supplies at Moscow, Russia. This company would like to receive catalogs and price lists from American manufacturers of foundry equipment and supplies, patternmaking machinery, etc. The address of the Moscow office follows: Actien-Gesellschaft Axel Christiernsson, Mjasnitzkaja 15.

Combined Motor Starting and Regulating Controller

A new type of controller for medium and large capacity direct current motors, manufactured by the Cutler-Hammer Mfg. Co., Milwaukee, is shown in the accompanying illustration. This controller consists of a multiple switch starter and a shunt field type speed regulator. The starting portion is similar to the standard Cutler-Hammer multiple switch



MOTOR STARTING AND REGULATING CONTROLLER WITH NO VOLTAGE RELEASE

starter designed for use with large motors or with motors of medium size when the starting conditions are severe. Each of the individual levers, when closed, cuts out a step of armature resistance, bringing the motor up to normal speed. The field regulating rheostat mounted above, as shown in the illustration, of a 50-horsepower, 230-volt type, consists of a series of field resistance steps controlled by a single lever.

When the motor has been properly accelerated to normal speed by cutting out the armature resistance, the field regulating resistance may then be used to secure further increase in speed. If the main line switch is opened or the current supply interrupted, the no-voltage release on the starter opens the starting switches and this, in turn, de-energizes the no-voltage release of the field rheostat, causing the lever to return to the full field position. The motor is, therefore, protected against starting on a weakened field or with a portion of the armature starting resistance short-circuited. Standard controllers of this type are made in sizes of 10 to 200-horsepower for 115, 230 and 500-volt circuits.

The Osborn Vibrator

The Osborn Mfg. Co., Cleveland, is now manufacuring a vibrator which is absolutely positive in its operation at all times and is guaranteed against sticking. The vibrator may be attached either to the pattern plate or to the molding machine, and is built in five sizes from ⅜ to 1⅝ inches. The positive action of the vibrator is due to the extreme accuracy of its manufacture. The vibrator body is made of high grade cast iron and the steel pinion is sufficiently heavy to impart ample strength to this device. A good bearing surface is provided by the use of steel against cast iron. In either end of the body, hardened tool steel pins are set, which receive the blow of the piston. A tempered steel wire spring is sunk into one end of the vibrator and surrounds the pin. The arrangement of the posts is one of the important features of this device and these are so located that they prevent the vibrator from sticking and insure its starting instantly when the air is admitted. All of the parts are carefully machined and this, in large measure, aids in making the vibrator positive in its action. Each vibrator has a convenient oil inlet and is individually inspected. The Osborn Mfg. Co. also has built a new knee valve for use with any type of vibrator. The valve is so constructed that the workman can operate it with his knee when his hands are otherwise employed.

The citizens of Fort William, Ont., on July 10 voted large amounts for the bonusing of industries and public improvements, including $250,000 for the establishment of a plant costing not less than $1,000,000 by the Canadian Car & Foundry Co., Ltd.; $16,000 to the McKellar Bedding Co., for a plant for the manufacture of iron beds, etc.; and $16,000 to the Great West Wire Fence Co., for a factory for the manufacture of wire fencing. Ground has already been broken and work begun on the car works.

A New Low Pressure Turbine Installation

Details of the Mixed Flow Steam Turbines of the Rateau—Smoot Type, Installed at the South Works of the Illinois Steel Co.

The Illinois Steel Co., Chicago, has placed in operation recently a low-pressure turbine installation at its South Works, which utilizes the exhaust steam of several reversing engines. The exhaust steam is directed into five steam regenerators furnished by the Rateau Steam Regenerator Co., New York. This steam regenerator equipment is so designed that the intermittent flux of exhaust steam is transformed into a steady flow taking care of full load on the steam turbines not only during the mill cycle, but when the mill cycle is interrupted for periods not exceeding two minutes.

The steam turbines are mixed flow machines of the Rateau-Smoot type. They were designed by C. H. Smoot of the Rateau Battu Smoot Co., and were manufactured by the Southwark Foundry & Machine Co.

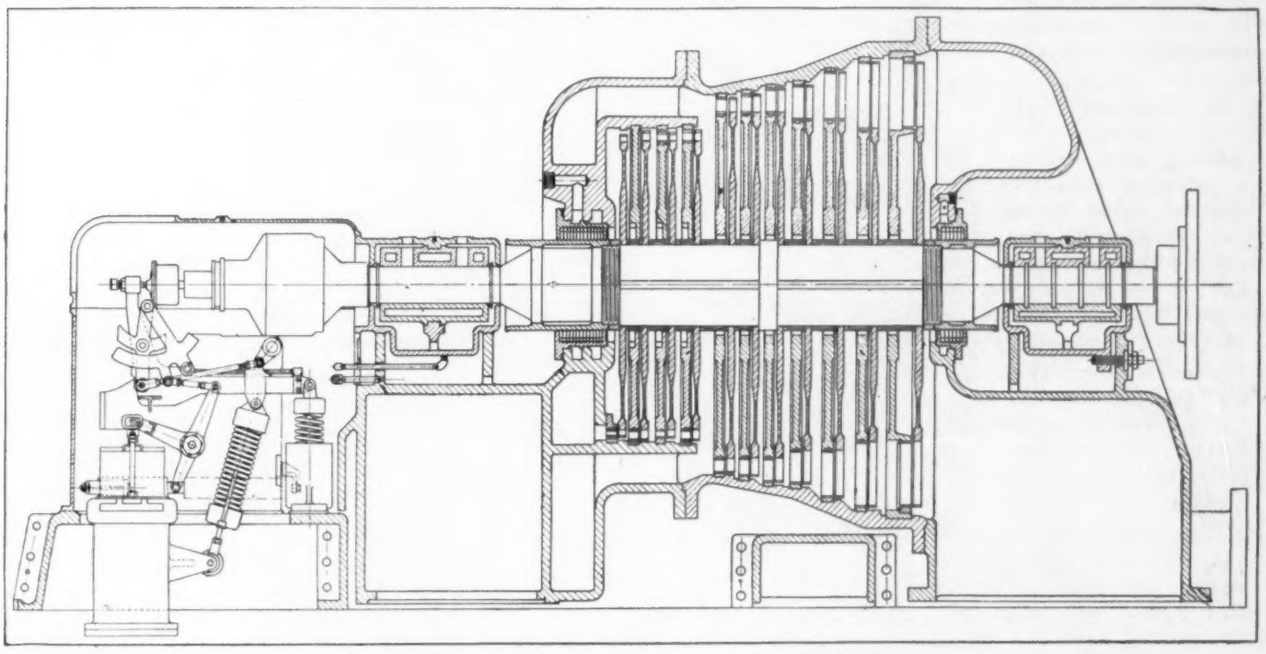
A cross-section of the Illinois Steel Co's. turbine is shown in the accompanying illustration. The turbine has an entirely independent high pressure section. High pressure steam passes through the high pressure wheels and after being expanded enters the low pressure section. In other words, the turbine when working on live steam is a complete high pressure machine. Around the high pressure section of the turbine the low pressure steam is admitted direct to the low pressure wheels. By means of this arrangement the highest possible economy obtainable is attained when working on either high or low pressure steam. The governor is so designed that the pressure of the low pressure steam controls the selection of the source of steam and no live steam is admitted to the turbine before the low pressure steam has become deficient. In other words, when the pressure in the low pressure source has reached atmospheric pressure in this instance. This occurs when the steam regenerators have been delivering steam during a shutdown of the mill engines for a period of more than two minutes and during this period the turbine has been carrying full load.

The turbine has a capacity of 3,000 kilowatts when using low pressure steam exclusively and when using high pressure steam can carry a continuous load of 4,000 kilowatts. Only one turbine is in operation at this time at the Illinois Steel works, the second turbine being under construction and will be ready to operate in one or two months.

Among the interesting features of the machine are the bearings, which have ring-oiled lubrication with water-cooling in the bushings. This is the largest turbine in the world having this form of lubrication and of bearing cooling. This very simple form of lubrication gives to the bearing a reliability heretofore unknown in machines of this size, since it is in no wise dependent on the continuity of operation of oil pumps or other auxiliary devices.

It is interesting to observe that the temperature of these journals is materially less than the temperature customarily encountered in machines of the same size in which lubrication is effected by means of oil under pressure and controlled by means of a separate water cooler

The stuffing boxes are also of somewhat novel form for machines of this size and are built-up of a number of consecutive rings of carbon blocks separated from each other by diaphragms and provided with springs which hold the carbons in contact with the shaft. The form of the carbons is such that as they wear away the spring always holds them in contact with the shaft so that no adjustment is necessary during the life of the box. In similar machines this form of packing has done service for five or six years



CROSS-SECTION OF A MIXED FLOW STEAM TURBINE

without its being necessary to replace worn-out carbons.

The governor also is of a decidedly novel form, since it is direct acting. The fly balls and spring against which they actuate are mounted within a steel shell, which is fixed directly on the high pressure end of the turbine shaft. The motion of the fly balls is transmitted by means of links directly to the high and low pressure throttle valves. The governor is given a great deal of energy and is very powerful, enabling it to have a very active control over the displacement of throttling valves, and has shown a very high degree of regulation at the Illinois Steel plant.

When first put into service the turbine regulation was adjusted for 3 per cent, changing from no load to full load. When placed in parallel with other machines it was observed that this turbine took all of the load when it increased and dropped most of its load when the load decreased, owing to the fact that the other machines with which it was in parallel were no where near as closely regulated, and it was found necessary to re-adjust the governor so as to give a 6 per cent difference between no load and full load speed in order that this unit might carry at all times its proper share of the load on the entire system.

The governing mechanism is so arranged that the action of the fly balls is to hold open the valves. In consequence of this feature the breakage or disconnection of any of the links between the fly balls and valves results in the valve falling closed by virtue of its own weight, which, in the case of the high pressure valve, is assisted by a closing spring.

Governor Tripping Device

The governor is also equipped with a releasing trigger which can be operated either by hand or by the over-speed device and acts to disconnect the valves from the fly balls and the governor, permitting the valves to fall closed whenever it is desired to shut down the turbine.

A single lever, which can be operated by hand, registers both high and low pressure valves into proper connection with the governor and replaces the tripping device in a simple manner.

It is possible to trip this governor and restore it within two or three seconds and when the turbine is running loaded the safety trip can be actuated by hand and the valves restored into commission without appreciably disturbing the load carried by the machine.

The mixed flow features of the governor comprises a piston actuated by the low pressure steam, which rises and falls with the pressure in the low pressure steam main When the low pressure steam has a higher pressure (in this case some 20 pounds), the piston referred to takes its proper position and causes the fly ball governor to actuate the low pressure valve for its full travel while holding the high pressure valve in a closed position at all times. As the quantity of low pressure steam decreases, the piston which it actuates descends, giving a greatly increased opening to the high pressure valve and decreasing the opening to the low pressure valve until it reaches its lower limit, under which conditions the low pressure valve is always in a closed position and the high pressure valve is actuated by the fly balls for its maximum displacement

An intermittent position of the control piston gives a simultaneous opening to both high and low pressure valves, thus causing the turbines to run on both sources of steam supply.

Turbine on Low Pressure Steam

It will be noted that by virtue of this arrangement the turbine tends to run exclusively on low pressure steam, provided its pressure is above that of the atmosphere, but when the pressure falls to that of the atmosphere the turbine takes less exhaust steam and more high pressure steam. The governor is virtually a regulator of the low pressure steam supply.

A feature which has been most specifically illustrated at the Illinois Steel plant in connection with this governor is that the load carried by the turbine does not change appreciably when the turbine goes from high to low pressure steam. This is due to the fact that a change in source of steam for driving the turbine is accomplished without any change in speed whatever and, therefore, without any shifting in position of fly ball governor. When the turbine is carrying half load its fly ball governor assumes an intermediate position, which position is exactly the same whether the turbine be driven from high pressure steam, low pressure steam, or a mixture of both. Other forms of mixed flow governors in which a change of speed or a different postion of fly ball governor is necessary to change from high to low pressure steam, are unable to accomplish this result when driving alternators which are electrically in parallel with other machines of similar kind, since the electrical action gives to the turbine a speed which is controlled by the entire system and not by the turbine governor.

The governor of the turbine at the Illinois Steel plant accomplishes this change by means of the low pressure steam and not at all by means of the speed of fly ball governor. In spite of this the fly ball governor is at all times in direct control of both high and low pressure valves and has absolute speed control of the turbine regardless of what source of steam it is operating upon and regardless also of the performance of the selective device which elects that the turbine shall run on high or low pressure steam.

William Cramp & Sons New Machine Shop

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, advising in regard to a new machine shop, which it is adding to its plant, says the new building is to be located at Richmond and Dyott streets, adjoining the company's present machine shop. It will be of the 80 per cent window type, 60 feet high, 141 x 458 feet, and will have three bays, the middle one being 76 feet, 2 inches wide, and the side bays 40 feet and 25 feet wide, respectively, with an outside storage yard 60 feet wide. There will be furnished for this building the following cranes: One 75-ton; one 50-ton; three 30-ton; one 20-ton; one 10-ton, and one 5-ton. The equipment will be of the latest electrically-driven machinery, consisting of boring mills, lathes and other large machines. The company is placing on a suitable foundation a 33-foot boring mill, one of the largest mills in the country at the present time.

The building will also be equipped with heating and electric lighting systems, as well as all the sanitary arrangements for this class of shop, electric elevators and fire escapes at each end and both sides of the building. Up to the present time all of the foundations have been put in, and the steel work is about ready for erection. The output will be approximately 500 cars of machinery a year.

The Rockwell Furnace Co., 26 Cortlandt street, New York City, is building three large, over-fired car type furnaces for the heat treatment of special steels, for the Crucible Steel Co. of America, Pittsburgh. Natural gas will be used as fuel.

Eastern Steel Co.'s Thin-Lined Blast Furnace

A Detailed Description of the Construction of This New Stack, Including the Novel Water-Cooling Features

Prior to the leasing of its works to the Eastern Steel Co., the Warwick Iron & Steel Co., Pottstown, Pa., practically had completed the construction of a new blast furnace of the thin-lined type. This stack has now been in successful operation for several weeks and embodies several novel features of design and construction. The furnace is 85 x 20 feet and is arranged to be used with the stove and power equipment of either furnaces No. 1 or No. 2, when either of the latter are out of blast.

A general view of the furnace is shown in Fig. 1 and a vertical section is illustrated in Fig. 2. The entire framework, including the columns, is made of wrought steel and the top platform, charging apparatus, etc., are supported independently of the furnace shell by columns resting upon the main columns which support the furnace. Platforms are provided at various levels so that all parts of the furnace casing may be readily accessible. The lower portions of the furnace columns are enclosed in cast iron casings filled with concrete. The inwall is cooled by water carried and distributed by a spiral trough of the Roberts type. The waste water from the tuyeres and bosh plates is delivered at different points in the spiral trough by an electrically driven pump. This trough is connected to the furnace shell by top bolts, *X*, Fig. 2, which do not pass through the shell, thereby avoiding the possibility of water entering the furnace around the bolts. A washer is provided around each bolt and between the trough and the shell. As a result, there is an opening between the bottom of the spiral trough and the shell which is continuous, except for the interference of the bolts.

At the lower end of the spiral trough the water is discharged into a horizontal trough which in turn is connected to the drainage system. The construction and operation of the spiral trough is such that while some of the water circulates around the spiral a large quantity passes through the openings at the bottom to the courses of the spiral trough below and continues its flow to the horizontal trough at the lower end of the spiral. In passing from one course of the spiral to that underneath, the water is in immediate contact with the furnace shell, thereby forming a thin film over all of the plates. The effect of a well-distributed spray is thereby secured with the additional advantages that the side of the spiral trough prevents the wind from interfering with the distribution of the water.

The bosh is enclosed entirely in a wrought steel casing having openings for the insertion of the bosh plates. The construction is of the Farrell-Roberts type. The bosh plates are held securely in position by angles on the inside and outside of the steel casing, the former angles being above and the latter below the bosh plates. The steel casing enclosing the bosh extends downwards to a point below the top of the hearth jacket and is provided with openings for the tuyeres, cinder notch and the row of bosh plates below the tuyeres. The hearth jacket is made of wrought steel plates which enclose a series of water-cooled cast iron plates. The furnace mantel is simple in construction and a continuous wrought iron casing is provided which extends from the top of the hearth jacket to the top of the furnace. The hopper is supported by an annular ring, the construction being such that the leakage of gas around the furnace top is rendered impossible. The furnace is equipped with 10 tuyeres and two cinder notches.

The brickwork of the stock line is protected by Cook high-carbon steel plates. The downcomer is connected to the furnace top by four branches equally spaced around the furnace, each connection being provided with a

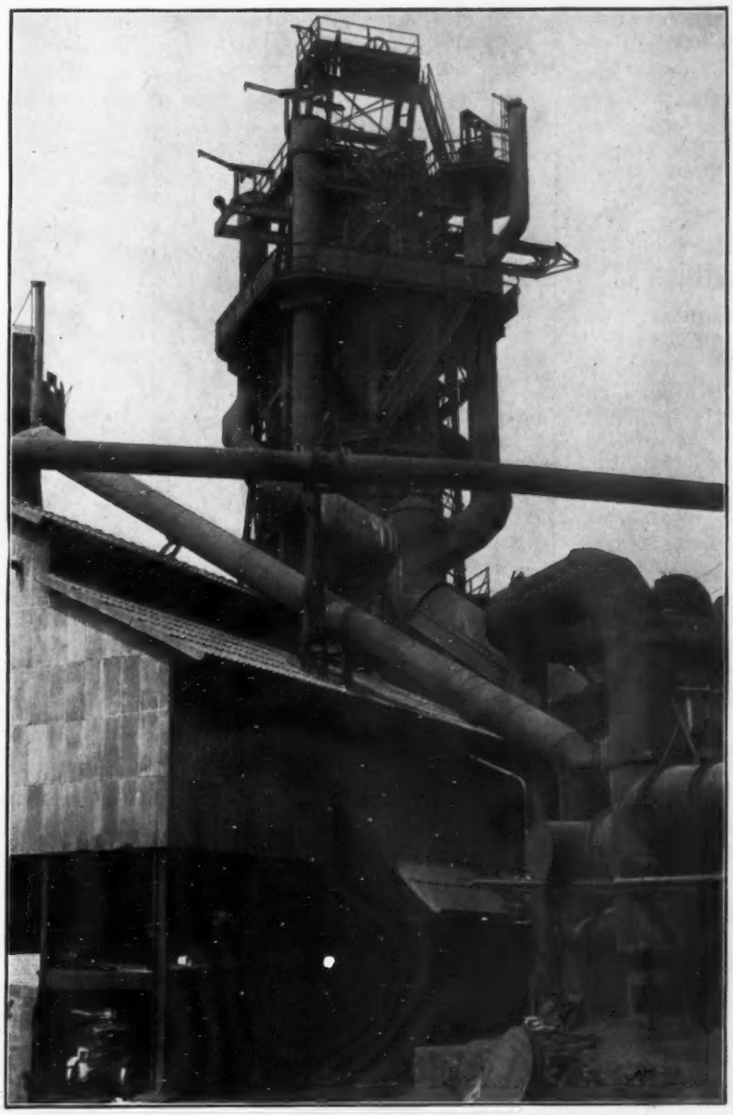


FIG. 1—THE EASTERN STEEL CO.'S THIN-LINED BLAST FURNACE AT POTTSTOWN, PA.

vertical pipe extending 22 feet above the furnace platform and is equipped with a Roberts relief valve. In the event of a slip these valves permit the escape of gas, but prevent the discharge of ore, coke, etc. The furnace charging apparatus is of the Roberts skip hoist design connecting below to the stock transfer system for all of the blast furnaces. The furnace and its equipment was designed and built under the supervision of F. C. Roberts & Co., Philadelphia.

New Rolling Mill Plant

Inquiries for equipment for the new plant of the Corrigan, McKinney & Co., Cleveland, to be erected at that city, have been sent out. Among items mentioned are: Eight 65-ton furnaces, a 40-inch blooming mill, a 44 x 76 x 60-inch twin tandem blooming mill engine, a large number of cranes, gas producers and other equipment. Cranes alone will aggregate an expenditure of about $250,000, it is reported. Plans have not been completed for the finishing department, as it has not been definitely decided as to what the products of this department will be. Plans for the buildings will come out this fall.

Coal Production Statistics of Kansas and Iowa

The production of coal in Kansas in 1911 was 6,254,228 short tons, valued at $9,645,572, according to a statement made public by the United States geological survey. In proportion to its coal production Kansas suffered more than any other state in the Mississippi valley region from the labor troubles in 1910, the decrease from the output for 1909 being 29.56 per cent and the production being the lowest during the last decade, 4,921,451 short tons, valued at $7,914,709. The production in 1911 increased 1,322,777 short tons, or 27.08 per cent, in quantity, and $1,730,863, or 21.87 per cent, in value. This, however, was not enough to bring the total up to normal.

In 1910 there were 12,870 men employed in the coal mines of Kansas, and of these, 10,346, or 80 per cent, were idle during the six months' strike. The average number of working days in that year was 148. The average production for each man was 382 tons for the year, or 2,585 tons a working day. In 1911 there were 11,625 men employed for an average of 189 days, the average production for each man being 538 tons for the year or 2.85 tons a day.

The major part of the coal output of Kansas is used for locomotive fuel and some of the larger mines are operated by the fuel departments of the railroads or by companies affiliated with the transportation interests. None of the product of such mines is marketed commercially.

In Iowa the total production of coal in 1911 was 7,331,648 short tons, valued at $12,663,507. The strike of 1910, which stopped production in most of the mines in the states of the middle west for the greater part of six months, lasted in Iowa for only six weeks, and the production in that state increased over that of the preceding year instead of decreasing. In 1911 the production of Iowa showed a decrease of 596,472 short tons in quantity and $1,240,406 in value. Prices were fairly well maintained and the average for 1911 was only 2 cents less than that for 1910, which was the highest recorded in recent years. The number of men employed in the mines of Iowa in 1911 was 16,599, who worked an average of 203 days and produced an average of 441.7 tons. The time lost by reason of strikes was about 0.7 per cent of the time made and did not affect the total production.

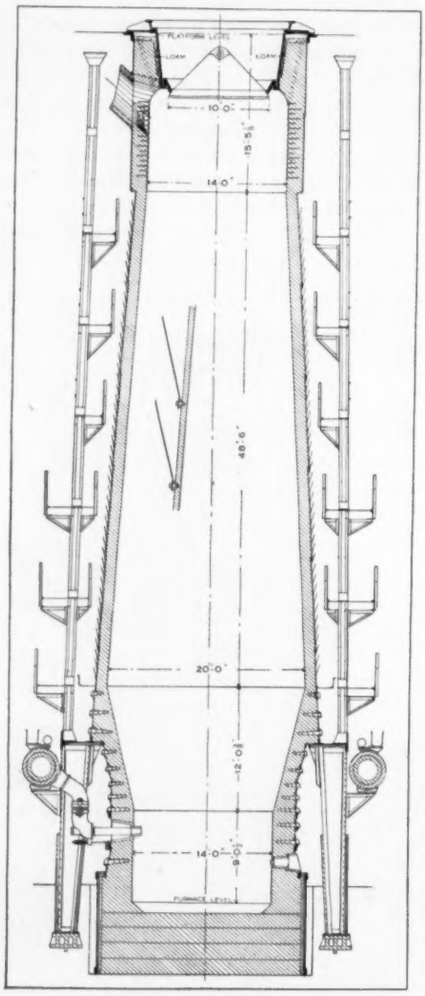


FIG. 2—VERTICAL SECTION THROUGH THIN-LINED BLAST FURNACE; *X* SHOWS THE METHOD OF ATTACHING THE SPIRAL TROUGH TO THE FURNACE SHELL BY TAP BOLTS

New Equipment Orders

Orders awarded by Vice President and General Manager Brown, of the Denver & Rio Grande, for new equipment aggregating $1,100,000, have been approved at St. Louis by President Bush. The Standard Steel Car Co., Butler, Pa., received a contract for 700 box cars with steel underframes, to be made at the Chicago plant. The Pressed Steel Car Co., Pittsburgh, got a contract for 350 all-steel coal cars, and the American Car & Foundry Co., St. Louis, was given a contract for 100 stock cars with steel underframes, to be made in St. Louis. The Haskell & Barker Car Co., Michigan City, Ind., was awarded a contract for 50 cabooses.

Consolidation of Industrial Plants

Capitalized at $2,000,000, the consolidation of the Russell Engine Co., Massillon, O., and the Spencer-Griscom Co., Jersey City, N. J., has been consummated, according to an announcement made yesterday. The Jersey City plant of the Spencer-Griscom Co. is to be moved to Massillon, and will give employment to 250 men. The Russell company employs twice that number. The Jersey City company manufactures steam power appliances and the Massillon factory builds steam engines. C. A. Griscom, Philadelphia, will be president of the consolidated concern, and Arvine Wales, Massillon, will be vice president. They, with C. M. Russell, will compose the directorate.

The Michigan Steel Casting Co., Detroit, will install a two-ton, two-piece converter for making steel for casting purposes. A 54-inch cupola also is being added, with necessary blowers and equipment, which are being furnished by the Tropenas Converter Co., New York City. At the present time this company is operating two converters and, owing to the heavy demands for steel castings, it has been compelled to add another steel-making unit.

Fire Pump Motor Control Panel

Front and rear views of a fire pump motor control panel, built by the General Electric Co., Schenectady, N. Y., is shown in Figs. 1 and 2. All of the operating parts are provided with bars having non-corrosive parts so that they cannot rust on account of long disuse and thereby prevent the motor from operating at the critical time. The complete panel is enclosed in a splash-proof case which effectively protects it from dripping water and also prevents the entrance of water if a stream from a fire hose should strike it. The panel is mounted on four pipe supports so that it cannot be reached by water accumulating in the basement where the panel is generally installed. The pressure governor connected to the water pressure system closes the control circuit of the panel as soon as the water pressure falls to a predetermined value, and starts the motor with all the starting resistance in the circuit. Current limit contactors automatically accelerate the motor by cutting out successive steps of this resistance. If desired, the motor may be started by hand by means of the operating lever at the right of the contactor. This method forces the contactors to close in their proper sequence by a cam shaft.

The panel is fully protected against failure of voltage and also from overloading. Two lamps are mounted on a panel, the one serving to indicate when there is voltage on the line, while the other indicates to the operator that the motor is running. The contactors which open the main line circuit are provided with powerful magnetic blow-outs which snuff the arc when a circuit is opened and prevent the burning of contactor parts. The circuit breaker used for overload protection has been designed especially for severe service. All current carrying parts are of ample cross-section which insures continuous operation without overheating.

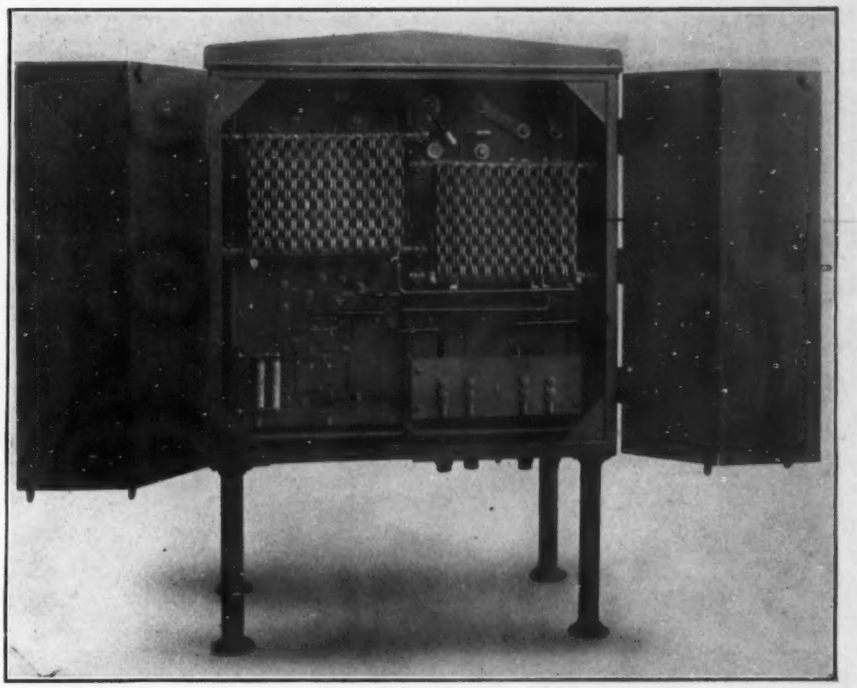


FIG. 2—REAR VIEW OF FIRE PUMP MOTOR CONTROL PANEL SHOWN IN FIG. 1

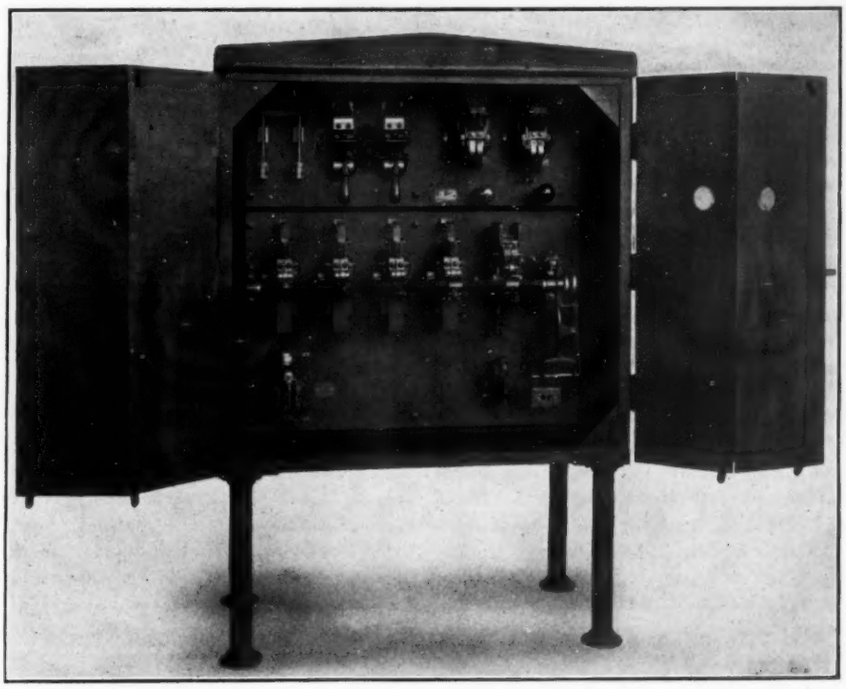


FIG. 1—FRONT VIEW OF AUTOMATIC CONTROL PANEL FOR 100-HORSEPOWER, 220-VOLT, DIRECT CURRENT, FIRE PUMP MOTOR

The iron grid resistance is of sufficient current carrying capacity for frequent starting of the motor. Frequent starting might be required in case one sprinkler head only should open, as this would cause a small flow of water in the pipe and the pump would be able to quickly refill the tank. At this point the control system stops the motor, to start it again only when the pressure falls to the value at which the pressure governor is adjusted to operate. This applies to panels controlling direct-current motors and a similar panel is built by the General Electric Co. for controlling slip ring type of induction motors where automatic control is obtained by means of a motor-operated dial switch. The latter may also be operated by hand if desired.

A special panel was installed in the coal pocket of the Delaware & Hudson company, near Schenectady, N. Y. The panel controls a 100-horsepower, 220-volt, 60-cycle slip ring induction motor, driving a centrifugal pump. In this instance the panel is controlled by a separate pressure governor at a remote point. These panels are not confined to fireproof service only, as they can be used to advantage in buildings for supplementing the city service and for insuring a sufficient water pressure for every-day use.

Ore-Handling Bridge in Cuba

The installation of modern mining and handling equipment in Cuba has been greatly accelerated by the tremendous recent development of the iron ore resources of that country. The erection of these plants is further advanced in the Mayari or north coast district, where the boats of the Spanish-American Iron Co. are loaded by large ore bridges and where the excavating and the loading of cars is accomplished by steam shovels and other powerful equipment. On the south coast, at Antilla, there has been installed recently, a new ore and coal handling plant for the Cuban railroad, which was built by the Mead-Morrison Mfg. Co., Cambridge, Mass.

This installation, shown in the accompanying illustration, has a capacity of 300 tons per hour and is designed for the two-fold purpose of unloading coal from ships and, in turn, for loading them with iron ore. At present the dock is used for the handling of coal, since the mines in the immediate vicinity, which could be served, are now idle.

The inshore span of the bridge is 150 feet; the tower has a span of 32 feet and the cantilever on the water side has an effective reach of 70 feet beyond the tower. This cantilever is so constructed that it may be raised when desired, in order to provide sufficient clearance for the ships to pass in and out of the slip.

The tower cabin is a 32 x 32-foot structure, 15 feet high. It contains the power plant, comprising one 200-horsepower vertical boiler; one 16 x 24-inch, vertical, double-cylinder, double-drum, hoisting engine; one 12 x 18-inch, vertical, double-cylinder, single-drum, reversing trolley engine; and one 10 x 12-inch, two cylinder, reversible engine which furnishes the motive power for moving the bridge along the tracks and raises and lowers the cantilever by means of a wire cable wound around a worm-geared drum. The power plant also includes one 200-horsepower feed water heater.

Immediately below the floor of the tower room is a 1,500-gallon water tank which contains the supply for the boiler. The water is shipped to the bridge in tank cars and from these it is pumped into the tank in the tower by means of a 100-gallon per minute feed pump. The tower is also provided with a hoist for hoisting coal from the cars below into the bunkers in the tower. The ashes from the boiler are readily disposed of by means of a chute through which they are lowered onto flat cars on the track below.

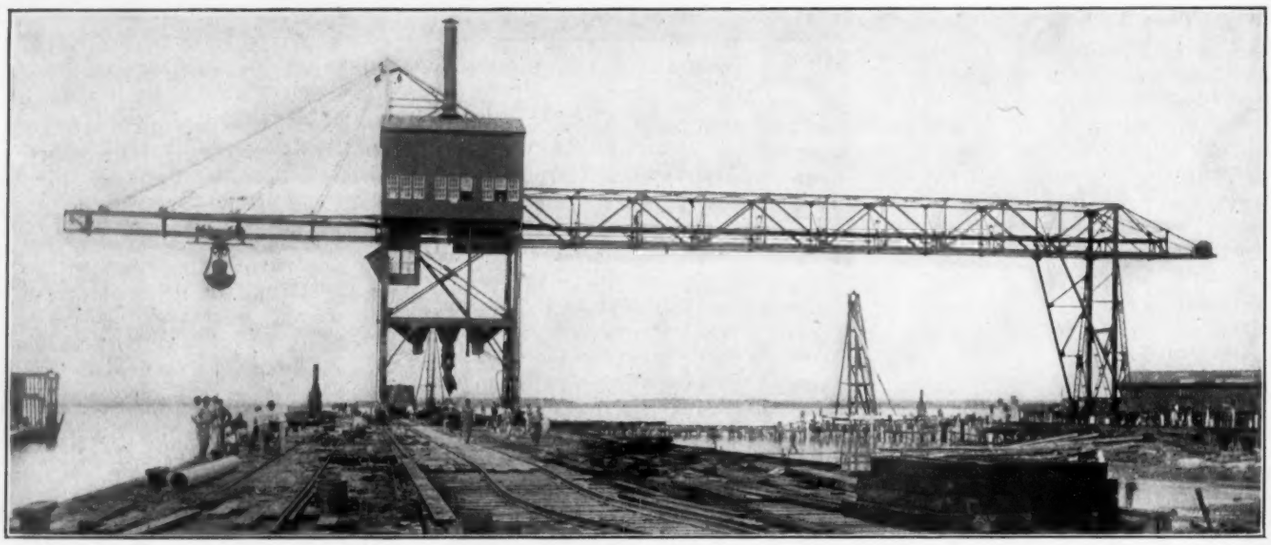
Only two men, a fireman and an operator, are required for the efficient operation of this bridge. The operator is posted in a stationary cab immediately below the tower cabin. In this cab are a number of hand and foot levers, which are conveniently placed. The engine which runs the trolley from end to end of the bridge is controlled by hand latches on operating levers in the cab. The hand latches operate steam cylinders which, in turn, control the motion of the trolley engine. The hoisting engine opening and closing drum is controlled by a right hand operating lever and the hoisting or holding drum by a left hand operating lever. The supply of steam to the hoisting engine is controlled by a foot lever.

The bridge is provided with one trolley which runs on 30-pound rails. The trolley is carried on four double flanged wheels. There are two buckets, one for ore and the other is a coal grab. Both have a capacity of two tons and are of the clamshell type

As shown in the illustration, the portion of the dock under the bridge span has not yet been filled-in. After this work is completed, it is proposed to build a trestle under the main span of the bridge. From this trestle the ore will be dumped from the cars to the ground and, in turn, it will be removed to the ships by means of the ore grab. The plant is at present provided with a railroad spur which runs along the edge of the dock under the cantilever and another which runs under the base of the tower. The latter was designed for the loading of cars with coal.

The coal hopper in the base of the tower has a capacity of about 60 tons. It is provided with four cut-off valves which have 30 x 30-inch openings. The hopper is equipped with a swivel chute which may be conveniently used for loading box cars. The track running along the edge of the dock under the cantilever will be employed for general cargoes, which may be handled by the bridge by means of a block and hook.

The bridge is provided with 16 wheels, 12 under the tower and four under the end of the bridge. These are 30 inches in diameter, are of cast steel, and have double flanges, both tread and flanges being machined. These wheels are run on 70-pound rail. The bridge has a total travel of 350 feet.

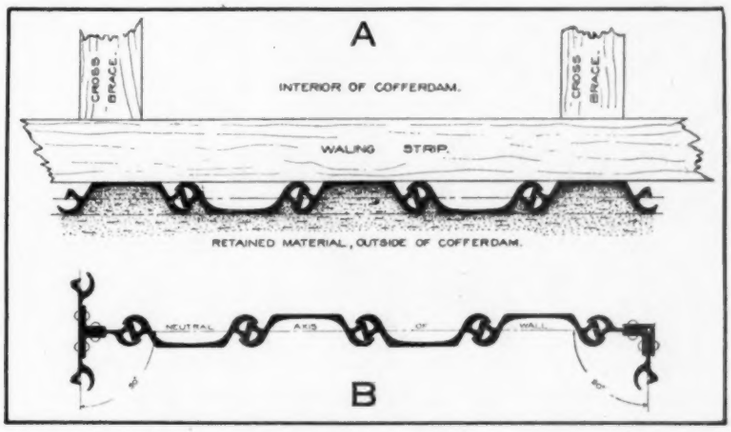


THE CUBAN RAILROAD'S ORE-HANDLING BRIDGE AT ANTILLA, CUBA

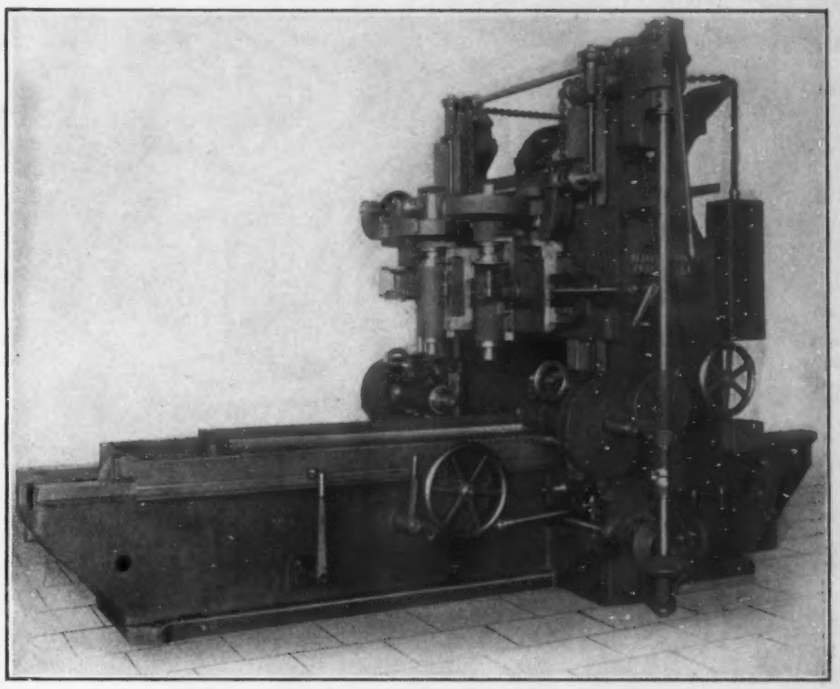
The New Tool Co., Cleveland, has increased its capital from $5,000 to $15,000.

Arched Web Steel Sheet Piling

The new, arched web steel piling bar manufactured by the Lackawanna Steel Co., Buffalo, is designed for structures of the braced type in which the pressure upon the piling is exerted by the material retained back of the piling wall. The piling is supported in the space enclosed by waling or by rods tied back outside of the wall. Interior bracing is the method generally pursued, but sometimes it is inconvenient in small cofferdams or in the construction of single walls. On work of this kind the piling is held in position by rods. The feature of this section is in the arching of the web which is curved in such a way that the mass of metal in the web is at one side of the neutral axis of the section. At *B*, in the accompanying illustration, the outer face of the web has been flattened to lie on the same vertical plane with the extreme outer face of the interlock. In the construction of the piling wall the arches reverse with each pile and each succeeding web is on the opposite side of the neutral axis of the wall. Therefore, the total thickness of the wall at the center of each pile is equal to, but not greater, than the overall thickness of the interlock. At *A* in the accompanying illustration, it will be noted that where the external side of the arch receives the pressure from the retained material, this pressure is transmitted to the waling timber, partially through the interlock directly and also through the interlock into the waling timber. The arched bar is designed for use especially where transverse or beam strength is a primary consideration. In a braced structure it serves as a small vertical beam. It permits of greater vertical spacing between supports or waling timbers for piling and thereby effects economy in the timber required. The bar is made in both light and heavy sections, the former having a weight of 35 pounds per square foot of wall and 40.83 pounds per lineal foot of piling. The width is 14 inches from center to center of bar. The heavy bar weighs 60 pounds per lineal foot and 48 pounds per square foot of wall. It is 15 inches wide from center to center.



TYPICAL SECTION OF ARCHED WEB STEEL PILING, SHOWING THE AMPLE BEARING SURFACE FOR INTERIOR BRACING AT *A*; *B* IS A VIEW OF THE PILING ASSEMBLED, THE JUNCTION AND CORNER BEING FABRICATED FROM STRAIGHT-WEBBED SECTIONS AND ANGLES



BEAMAN & SMITH FOUR-SPINDLE MILLING MACHINE

Four-Spindle Milling Machine

A four-spindle milling machine, built by the Beaman & Smith Co., Providence, R. I., is shown in the accompanying illustration. To the bed are attached the uprights which carry a cross-rail having a vertical movement and each upright supports a horizontal spindle and the cross-rail, two vertical spindles. These spindles have vertical and horizontal movements on the uprights and the cross-rail, respectively. The table has a work surface, 30 inches wide and 10 feet long. It is provided with five T-slots and two rows of holes for stop pins. Its movement on the bed is 11 feet. The quick power movement of the table is at the rate of 7 to 14 feet per minute in either direction and automatic feeds can be arranged to maintain the desired rate at any spindle speed. The table feeds are positive in either direction and nine changes of feed are provided from 2 to 12 inches at any spindle speed.

The spindles are made of crucible steel; they operate in phosphor bronze boxes and have independent adjustment of 6 inches. The ends are made to fit cutters, as specified. The front bearings are 4 inches in diameter and 6 inches long and the rear bearings, 3⅜ inches in diameter and 4¼ inches long. The spindles can be operated singly or in unison at speeds varying from 6½ to 50 revolutions per minute. The centers of the vertical spindles are 6 inches in advance of the horizontal. The distance between the uprights is 43 inches and between the centers of spindles the minimum is 12 inches and the maximum 30 inches. The machine can be arranged for either belt or motor drive, a 15-horsepower motor being required.

Electric Furnace Reactions

The chemical action that takes place in an electric furnace during the refining of steel results in the dephosphorization and desulphurization of the bath, according to the statement made by Cecil Myers in a paper read before the Manchester (Eng.) Association of Engineers. The action takes place in two stages. In the first, which is the oxidation period, the carbon, silicon and manganese are oxidized and in the second, which is the deoxidation period, the metal is dead-melted, and the sulphur is eliminated. The first action is brought about by adding to the charge, certain quantities of lime and oxide of iron, which, under the influence of the high temperature, oxidize the carbon, silicon and manganese, and remove the phosphorous as calcium phosphate. After this operation, the slag is removed from the bath, and further quantities of lime and sometimes carbon, are added. This is the second stage, when the sulphur passes into the slag as calcium sulphide which is not soluble in the bath.

In the open-hearth furnace, calcium sulphide would be readily oxidized into calcium sulphate which would combine with the iron to form sulphide of iron, carrying the sulphur back into the steel. In the reducing atmosphere of the electric furnace this change cannot take place, so that it is possible to remove the sulphur to almost any extent. In reply to a question as to whether good steel castings could be produced by the electric furnace, Mr. Myers stated that they certainly could, but they would be more expensive at present than the product of the open-hearth furnace, and probably not much better.

Upon completion of a new plant on Rubber avenue, in Naugatuck, Conn., the Risdon Tool & Machine Co., will move from Waterbury, Conn. The main building of the new plant will be 40 x 128 feet, and one story high. There is also to be a building for a power plant, 20 x 40 feet. This concern is the successor of the Risdon Tool Co.

Reviews of Catalogs and other Trade Publications

FLOORING.—The Jennison-Wright Co., Toledo, has issued a pamphlet devoted to "kreolite" floors.

LATHES.—Lathes and grinders are described in a catalog issued by the Conover-Overkamp Machine & Tool Co., Dayton, O.

MOTORS.—Various types of motors are described in a bulletin issued by the Crocker-Wheeler Co., Ampere, N. J.

PUMPS.—In an artistic booklet, issued by the Deming Co., Salem, O., pumps of hand, windmill and power types, of various designs and sizes are described and illustrated.

VALVES.—The D. T. Williams Valve Co., Cincinnati, has issued a folder describing and illustrating the "Cinco" iron body gate valve, which is designed for low pressure service.

KEYSEATING.—Information covering the subjects of keyseating and keyways is given in a book issued by the W. P. Davis Machine Co., Rochester, N. Y.

STEEL VALVES.—Forged steel valves are featured in a four-page circular sent out by the Patterson-Allen Engineering Co., 2 Rector street, New York.

DRILLS.—The New Process Twist Drill Co., Taunton, Mass., has issued its catalog for 1912. Carbon steel drills, high speed steel drills and "Reliance" high speed steel drills are listed and fully described.

NOZZLES.—"It's all in the nozzle when it comes to a cooling system," according to a recent pamphlet issued by the Spray Nozzle Co., Boston. Illustration of nozzles and cooling ponds are included.

ENGINE FITTINGS.—The J. E. Lonergan Co., Philadelphia, has recently issued a booklet in which the Lonergan pop safety valves, gages, counters, oil cups, etc., are described and illustrated.

SPECIAL TOOLS.—Tools for cutting screw threads are described in a catalog issued by the J. M. Carpenter Tap & Die Co., Pawtucket, R. I. Taps, dies, screw plates, die-stocks, tap wrenches, etc., are illustrated.

DRILLS.—Upright drilling and tapping machines are discussed in a pamphlet recently issued by the Cincinnati Bickford Tool Co., Oakley, Cincinnati, O. Different types of drills are illustrated and described.

AIR CLEANERS.—The Lagonda Mfg. Co., Springfield, O., has issued a four-page bulletin illustrating its new air cleaner. One of the company's automatic lubricators also is mentioned.

ROOFING MATERIAL.—The Cincinnati Iron & Steel Co., Cincinnati, describes "Cisco Led Kote"—a material for roofing in which pure lead has been applied to steel without any alloy,—in a recently issued publication.

HEAT TREATING FURNACES.—The W. S. Rockwell Co., 50 Church street, New York City, in a four-page circular, describes and illustrates light forging tool dressing and heat treating furnaces. Either oil or gas can be used for fuel.

GASOLINE ENGINES.—Gas and gasoline engines are described and illustrated in a 24-page catalog issued by the Quincy Engine Co., Quincy, Pa. Stationary, semi-portable and portable engines, tractors, air compressors, etc., are featured.

MACHINE TOOLS.—Numerous designs of punches and presses are to be found in a well-arranged catalog, containing 100 pages, issued by the Rock River Machine Co., Janesville, Wis. Then, too, there are shears, designed for scrap yard and rolling mill use, described and illustrated.

WIRE ROPE.—The "Whyte Line" is the name of a new booklet published by the Macomber & Whyte Rope Co., Chicago. The issue is unique. Aside from describing Whyte Line rope there is a donation of Scotch dialect by "Sandy", and a couple of other well-told stories make the booklet unlike other trade publications which come to our notice.

CUTTING AND THREADING MACHINES.—More than a score of pipe cutting and threading machines are illustrated and described in a 32-page booklet recently mailed to its patrons by the Curtis & Curtis Co., Bridgeport, Conn. Many of the machines mentioned are arranged for both hand and power operation. Price lists for different machines are included in the catalog.

MOLDING MACHINES. — The Osborn Mfg. Co., Cleveland, has issued a handsome loose leaf catalog devoted to its extensive line of molding machines. These include the following types: Power and hand-ramming, direct-draw, rock-over, roll-over, rock-down, adjustable flask-stripping, drop-plate squeezer, as well as special machines for making cores. The illustrations, to a large extent, show practical shop operations and the construction of these machines is described in detail. A pattern drawing device and a core sand washing machine are shown, in addition to foundry accessories including snap flasks, flask trimmings, vibrators, etc.

VANADIUM STEELS.—The American Vanadium Co., Pittsburgh, in an 80-page catalog, gives comprehensive directions for the application of vanadium to iron and steel and the classifications and heat treatment of vanadium steels are extensively covered. Various types of vanadium steel are considered at length with interesting data covering their physical properties and chemical constituents. The addition of vanadium steel in acid and basic open-hearth, crucible, Bessemer, Tropenas and electric furnace practice, is described in detail and directions are given for its addition to cast iron. This work can be considered a text-book on vanadium and should prove of value to metallurgists, steel works operators and foundrymen.

ELEVATING, CONVEYING AND POWER TRANSMISSION MACHINERY. — An exceedingly comprehensive catalog of 576 pages, devoted to elevating, conveying, power transmission machinery and coal mine equipment, has been issued by the Jeffrey Mfg. Co., Columbus, O. The first section is devoted to installation views which is followed by more than 200 pages on chains, attachments, sprockets, wheels, etc. Practically 200 pages are devoted to conveying, elevating, machinery, etc., and the catalog concludes with more than 100 pages on power transmission, crushers, pulverizers, screens, chutes, car dumps, mine fans, electric locomotives for mine and industrial haulage, etc. The work is well-illustrated and contains a well-arranged index.

FOUNDERS' WEEK

Buffalo Prepares for the Foundrymen's Convention.

Preparations now are being made for the exhibit of foundry equipment and supplies which will be held in the Broadway exposition building, Buffalo, during Founder's Week in the Bison city, beginning Monday, Sept. 23. Concurrent with this exhibit will be held the annual conventions of the American Foundrymen's Association, the American Institute of Metals and the Associated Foundry Foremen. The reconstruction of the exposition building has been practically completed and an unusually large number of applications for space already has been received. The indications are that the number of exhibits will exceed the total at Pittsburgh last year.

Any firm or individual manufacturing or selling foundry and pattern shop equipment and machine tools, or any article pertaining to the manufacturing industry may exhibit, providing he obtains a permit from the Foundry & Machine Exhibition Co. A charge of $25 is made for this permit and the price of space is 50 cents per square foot with an extra charge of 10 cents per square foot for corners. As far as possible the exhibits will be classified and the assignment of spaces will be made Aug. 1.

In a communication issued by C. E. Hoyt, secretary of the Foundry & Machine Exhibition Co., Lewis Institute, Chicago, the exhibitors are notified to have their displays installed before 9 a. m., Monday, Sept. 23. On Monday and Thursday the exhibition will be open from 9 a. m. to 10 p. m. and on Tuesday, Wednesday and Friday the exhibition will close at 6 p. m. No signs will be permitted except those approved by the management. These will be of uniform size and will be installed by the Exhibition company. A general admission of 25 cents will be charged and season tickets for the week will be sold at a price of $1 each.

Where the Exhibition Will be Held

The exposition building is located on Broadway, a short distance from the principal Buffalo hotels. The floor of the building is wood laid on concrete on the ground level, there being no basement or excavation under any part. The entire floor space, 176 x 275 feet, is free from columns or posts with the exception of a row of posts 8 feet, 6 inches from the wall which support a balcony all around the building. The Exhibition company will provide, without cost to the exhibitors, compressed air at about 80 pounds pressure and electric current. Alternating current will be used in all cases except where it is absolutely necessary to have direct current. The General Electric Co., Schenectady, N. Y., will loan motors to exhibitors on condition that they pay all transportation expenses and insure the motors against damage other than ordinary wear. Exhibitors desiring to avail themselves of this opportunity should correspond directly with the General Electric Co.

The headquarters of the various organizations will be as follows: Foundry & Machine Exhibition Co., Hotel Lafayette; American Foundrymen's Association, Hotel Statler; American Institute of Metals, Hotel Iroquois, and the Associated Foundry Foremen, Hotel Broezel.

Association Meetings

The meetings of the American Foundrymen's Association will be held at the Hotel Statler on Tuesday, Wednesday and Thursday, Sept. 24, 25 and 26. Dr. Richard Moldenke, secretary of this organization, already has announced that the papers which will be read will prove unusually interesting, particularly to steel and malleable foundrymen. An exhaustive report on molding sand tests will be submitted. The investigations of this problem have shown that widely varying results are obtained with sand in various foundries, which is due undoubtedly to the low cost of sand in such foundry districts and the consequent inattention to sand economy except when the disposal of the burnt sand becomes an acute problem. At the time when the molding sand tests were undertaken, requests for sands were sent to all dealers in this commodity as well as to the members of the association. The response was generous and the results which will be reported are based upon the study of 80 natural molding sands, most of them well-known standards. In addition, there have been prepared 12 combinations of sand and fireclay, to form a series of artificial molding sands for foundry use. The physical tests of 92 different sands were made by Dr. Moldenke in addition to rational analyses, mineral determinations, etc.

The Institute of Metals, formerly the American Brass Founders' Association, promises an unusually interesting program and a large number of papers already has been prepared and has been submitted to Secretary W. M. Corse. The entertainment features, although not definitely outlined, will insure the visitors an enjoyable, though busy week.

Henry D. Miles, of the Buffalo Foundry & Machine Co., is chairman of the general committee in charge of the convention preparations, and other committee chairmen follow: T. L. Richmond, Buffalo Machine Co.; W. H. Barr, Lumen Bearing Co.; Walter F. Semon, Frontier Iron Works, and Henry W. Wendt, Buffalo Forge Co. Frank W. Tracy, of the Buffalo Chamber of Commerce, is the special representative of this organization working in conjunction with the various foundrymen's committees.

MERGER FORMED

By Emerson-Brantingham Co. — Seek to Increase Capital.

A merger capitalized at $50,000,000 has been formed by the Emerson-Brantingham Co., Rockford, Ill. The concerns included are the Emerson-Brantingham and the Emerson Carriage Co., Rockford; Emerson-Newton Implement Co., Minneapolis; Emerson-Newton Co., Kansas City; Emerson-Brantingham Plow Co., Dallas, Tex.; Emerson-Brantingham Implement Co., Spokane, Wash.; Gas Traction Co., Minneapolis, and La Crosse Tool Co., Chicago Heights, Ill.

Application has been made at Springfield, Ill., for permission to increase the capital stock of the Emerson-Brantingham Co. from $6,000,000 to $50,000,000. A grain drill company, a wagon manufacturing company and a thresher company are to come into the merger.

While officers have not been elected it is understood that the organization will be formed as follows: President, Charles S. Brantingham; vice president, Fred Glover; secretary and treasurer, J. W. McLachlin; general counsel, E. P. Lathrop.

Orders 65 Koppers Ovens

The H. Koppers Co., Chicago, has just secured from the Inland Steel Co. a contract for 65 of its latest type by-product, cross-regenerative coke ovens. Each oven will have 13¼ tons capacity and for the operation of the plant 1,300 tons of coal will be required daily. A guaranteed coking time of 16 hours is specified.

The ammonia will be recovered by the Koppers direct process in the form of ammonium sulphate and the gas will be used for reheating purposes in the steel plant now owned and operated by the Inland Steel Co., at Indiana Harbor.

The location of the ovens will probably be directly to the rear of the present blast furnace plant and it is expected that they will be completed and in operation by September, 1913.

THE IRON TRADE REVIEW

DEVOTED TO THE IRON, STEEL, MACHINERY AND FOUNDRY INDUSTRIES

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Prospects of Railroad Earnings

It has lately become not improbable that eventually the railroads will be allowed to make some important rate advances through what until quite recently would have been regarded as easily the most unlikely influence, a physical valuation. Enough has been done by way of valuation to suggest that a complete showing would be much more favorable to the railroads than has hitherto been assumed. In several states, partial valuations have been made, in a spirit which can be regarded on the whole as unfavorable to the railroads, and these valuations have in nearly every instance proved high, compared with the expectations.

The railroads themselves have started making valuations on their own accounts. The New York, New Haven & Hartford has completed a thorough valuation of its property, the New York Central has appraised parts of its system, and the Chicago, Burlington & Quincy has just announced that it has undertaken a complete valuation. Other railroads are planning similar valuations.

One important reason for this work on the part of the railroads themselves is the expectation that eventually, and probably in the not distant future, a valuation by the Interstate Commerce Commission will be undertaken. The Adamson bill for a general railroad valuation, now pending in congress, stands fair chances of passage at the short session.

A federal valuation must necessarily go far towards molding sentiment and influencing the fixing of rates, though it is, of course, practically impossible to formulate a basis which will please all parties. In directing their accounting system, the Interstate Commerce Commission has had many clashes with the railroads, though such work is simple, compared with that of a valuation. As illustrating the awkwardness of some of the points already in dispute, it may be mentioned that the present rules prescribe substantially the following: If there is a piece of track involving certain grades and by cutting and filling those grades can be reduced to a certain standard with a given expenditure, but by building a new line the same standard of grade can be attained with a lesser expenditure, then the rules allow that under the first alternative the expenditure can be charged to betterment, but if the second alternative be chosen, the cost of the line abandoned must be written off. Railroad managers quite naturally say there must be something wrong in such a system. Again, if a railroad uses steel ties instead of wooden ties for replacement, it is not allowed to charge any part of the expense to betterment, although the steel ties cost much more, and insure for the future a very material reduction in upkeep. This principle could not be carried into any plan for physical valuation, for obviously then the road laid with steel ties should be valued higher than if laid with wooden ties.

Constantly the railroads have been expecting that eventually they would be allowed to raise rates, their feeling being that there was an era of reductions which finally would yield to the necessities of the case, but month after month the record is that of every hundred rate changes passing through the Commission, only about one is an advance. Perhaps, after all, it will ultimately be found that a physical valuation will be the means of bringing about rate advances.

Whatever the relation ten years ago, or at present, between actual value of the railroads and the securities issued against the properties, there can hardly be any question that the improvements of the past decade have tended to improve that relation. There has been much improvement in properties which has not been attended by a corresponding increase in capitalization. In the substitution of heavy for light steel rails, in the steady supplanting of wooden cars by steel cars and in many other respects the railroad properties have been improved, year by year, beyond the increases in capitalization standing against them. In the older days, of course, it was different. When a road got into financial difficulties, it made securities instead of improvements, but in recent years the trend has been towards the position in which a physical valuation would place the railroads in a better light.

Big Business and Labor

During the past few years, when manufacturing has progressed at an unprecedented rate, and when countless small concerns have been merged into larger ones, many people, including some of the thoughtful class, as well as many who take a superficial view of things, have become apprehensive and have taken a pessimistic view concerning modern tendencies in the business world. Heartless practices indulged in by some big companies have furnished much ground for complaint. The danger has been, that public opinion, inflamed by agitators, would demand changes which would make conditions ultimately worse than they are today. This danger still exists. Hence, it is extremely gratifying to peruse a document which takes a sane and optimistic view of events and tendencies and shows how big business is better than little business, especially for wage earners. A document of this kind is the address of James T. McCleary, secretary of the American Iron and Steel Institute, delivered at the annual meeting of the Academy of Political and Social Science, and recently re-printed in pamphlet form from the annals of the Academy.

Although in the prime of life, Mr. McCleary has lived long enough to be able to tell from his own experience what great changes have taken place, how little business has gradually given way to big business, and how in many ways the changes are beneficial.

He tells how big business has resulted in shorter hours of labor, how conditions of the workmen have been improved, how steadiness of employment has been promoted, how opportunities for promotion have been improved, and why ownership in big business is easier to get and safer to have than were interests into the partnerships common in past years.

Mr. McCleary does not claim perfection for big business, but he declares that the trend of events is in the right direction. Perhaps he is a little too sanguine in saying that the bigger the corporation the more soul it must have. It certainly is hard to believe that of some mighty organizations. But all can agree with Mr. McCleary when he says, "Never before in the history of the world has so much intelligent thought been given to the just and humane conduct of business as now. And big business is leading the way." We should add that enlightened public opinion and just governmental regulation, as companions for big business, would make the journey safer. It is well even for big people to have good company.

Mr. McCleary has sounded a note of optimism in writing a document which deserves wide circulation, especially among intelligent working men.

Reasonable Regulation

The recent decision of the Interstate Commerce Commission in regard to rates for carrying express packages is a matter of far reaching importance which a few years ago would have been regarded as almost revolutionary. The fact that this action was received so complacently by the business world shows that when a governmental proceeding is righteous it will not cause commotion of a disturbing character. It also shows that the country is becoming accustomed to regulation by the government and will not object to it if it is reasonably conducted. The point of fundamental importance is that the action shall be based upon justice and carried out in a spirit of fairness.

Practically to reorganize a great business, as has been done in the case of the express companies, is a tremendous undertaking. It ought not to be done hastily, but with the greatest wisdom, after a thorough investigation. That was the course pursued by the Interstate Commerce Commission. Hence, the position of the Commission is impregnable. It is just, and it will be supported by overwhelming public sentiment. If we could have more regulation of this kind, and less dissolution, it would be well for the country.

The Rod and Shape Production Statistics

A remarkable divergence is shown by the production of wire rods and structural shapes in 1911, just reported by the American Iron and Steel Association and given in these columns in our issue of July 18. The 1911 rod production exceeded that of 1910 by 10 per cent, while at the same time there was a decrease of 6 per cent in the structural shape output. Another curious feature is that in 1909 both these products showed a larger tonnage than in 1910, whereas in pig iron, and in steel generally, 1910 showed a decided increase over 1909. The figures are as follows, in gross tons:

	Pig Iron.	Steel.	Rods.	Shapes.
1909.....	25,795,471	23,955,021	2,335,685	2,275,562
1910.....	27,303,567	26,094,919	2,241,830	2,266,890
1911.....	23,649,344	23,675,501	2,450,453	1,912,367

It was decidedly strange that both rods and shapes should show a decrease from 1909 to 1910 when the raw materials both showed a large increase. The increase in rod production in 1911 and decrease in shape production are both natural enough incidents to the character of the products and their use. Wire is ubiquitous; structural shapes go chiefly in large projects. When an "off year" comes, wire stands up well and shapes suffer. Tin plates are in the same general class with wire, while rails are in the same class with shapes. Tin plate statistics for 1911 are not available, but it is well understood that production showed little, if any, decline. Rail statistics are available, and they show only 2,822,790 tons in 1911, against 3,636,031 tons in 1910 and 3,023,845 tons in 1909.

Thus there is well illustrated the general fact that as general business is good or bad, the heavy lines fluctuate the most in tonnage and the light lines the least. A year may come which is only moderately bad, and then some of the light lines may derive enough strength from the normal tendency to grow, to show an actual increase in output. One should not despise the day of little things.

Pig Iron in Presidential Years

Last winter, fears were entertained that because this would be a presidential year the iron trade could not be good. Now it is found that the year is a good one, and all production records will be broken. Pig iron production will probably be not far either way from 29,000,000 tons, which would be 6 per cent beyond the record, and steel production is certain to make a much better showing than pig iron. If pig iron gains 6 per cent upon the record, steel production is likely to gain 20 or 25 per cent.

It is interesting, therefore, to see how iron has fared in presidential years in the past. The record of pig iron production may well be taken as a guide. Following 1860, we have had 12 presidential years, and taking a period of 50 years, or 1862 to 1911, inclusive, we find that 30 of the years were record breakers and 20 did not break records, so that the record breakers were 60 per cent of the total. Of the 12 presidential years which intervened, six of them were record breakers and six were not, which is 50 per cent. Now the difference between 50 per cent and 60 per cent is not great. Fortuitous circumstances might easily make more difference than that, and it is well to look at the individual presidential years which did not break records. They were, 1876, 1884, 1892, 1896, 1904 and 1908. As to 1908, everyone knows that if it had not been a presidential year, it would have been bad anyhow, and the same can be said of 1904. It would be absurd to blame the poor business in those years upon the fact of there being presidential campaigns. Indeed there is some doubt as to whether there even were real political campaigns in those years. Then we have 1896 and 1876, both in periods of prolonged industrial depressions, which would certainly excuse those years from the obligation to make new records. This summary goes far towards explaining the cases of the four of the six presidential years which were not record breakers, indicating at least that politics can not be blamed entirely, although the free silver agitation of 1896 had a depressing effect. In the other presidential years, 1884 and 1892, in which records of production were not broken, various causes besides politics contributed to the depression.

As we have shown in previous editorials, the notion that a presidential year is necessarily destructive to prosperity is not well founded.

MEN OF THE IRON TRADE

Frank Samuel, of Philadelphia is homeward bound from a business trip to England.

Benjamin Nicoll, of B. Nicoll & Co., New York, sailed for Europe July 24, on the Mauretania.

Horace L. Lane, consulting engineer, has been engaged to construct the proposed plant of the Eastern Car Co., in Nova Scotia.

Joseph G. Butler Jr., of the Brier Hill Steel Co., Youngstown, O., accompanied by his family, has gone to the Maine coast for a short vacation.

R. W. Gillispie, who has been assistant sales agent of the New York office of the Pennsylvania Steel Co. for six years, has been made sales agent of that office.

Frank Orchard, for several years purchasing agent for the Carbondale Machine Co., Carbondale, Pa., has been elected secretary-treasurer of the American Welding Co., Simpson, Pa.

Samuel M. Vauclain, vice president of the Baldwin Locomotive Works, has been elected a director of the Philadelphia Trust, Safe Deposit & Insurance Co., 413-417 Chestnut street, Philadelphia.

Fred Karste Jr. has been elected president of the Sheboygan Machine Co., Sheboygan, Wis. A. Steffen Jr. has been made vice president, Lester Nelson treasurer and Charles Kummers secretary.

James A. Carey is manager of a warehouse recently established in Pittsburgh by the Hill & Griffith Co., Cincinnati. A complete line of foundry equipment is being carried at the new warehouse.

Ross R. Harrison, former superintendent of the forge department of the Pennsylvania Steel Co., Steelton, Pa., is connected with the sales and executive forces of the Watson-Stillman Co., 50 Church street, New York.

John G. Brown, of Chicago, is visiting his properties on the Vermillion range. He is one of the fee owners of the Savoy mine and also owns undeveloped property adjoining the Section 30 mine.

P. W. Sothman, for six years chief engineer of the Ontario Hydro-Electric Commission, has resigned his position and will engage in the practice of his profession with headquarters in Toronto. He will be retained by the commission as consulting engineer. F. A. Gaby, who has been his assistant, succeeds him as chief engineer.

James D. Frisbie, heretofore doing business in Cleveland as a broker in scrap iron, etc., has closed out his business and has become associated with E. A. Schwarzenberg, Garfield building, Cleveland.

W. H. Davis, superintendent of the Farrell plant of the American Sheet & Tin Plate Co., at Sharon, Pa., will leave this week for a two months' trip abroad. He will visit England, Wales, Scotland, Ireland and France.

A. F. Gross, president of the Mangan Iron & Steel Co., Duluth, Minn., has returned from an inspection trip

J. LEONARD REPLOGLE
Assistant to president of the Cambria Steel Co.

to the company's property on the Cuyuna range. He secured reports relative to the drillings on the property.

Lazard Kahn, stove manufacturer of Cincinnati and Hamilton, Ohio, had a narrow escape recently when his automobile was struck by a locomotive at Carthage, O. The machine was almost entirely demolished, but Mr. Kahn escaped uninjured.

Howard F. Martin, general manager of sales of the Pennsylvania Steel Co., Philadelphia, who has been connected with the company 22 years, will resign from the company Aug. 1. John C. Jay Jr., at present manager of sales in New York, has been appointed acting general manager of sales, with offices in Philadelphia.

F. E. Cragin, Horace Speed, William Coyle and William McCoy have been named as directors of the Southwestern Iron Co., Guthrie, Okla., to fill vacancies caused by the resignation of C. H. Martindale, Frank Dale, Dr. Hughes and B. F. Hegler.

Walter B. Spellmire, who has been connected with the sales force of the Allis-Chalmers Co., Milwaukee, for a number of years at its Pittsburgh office, has resigned to accept a position with the Pittsburgh office of the General Electric Co., Schenectady, N. Y.

Dr. S. W. McNair, president of the Michigan College of Mines, was temporary chairman of a meeting held at Houghton, Mich., last week at which a Michigan chapter of the American Mining Congress was organized. Directors were elected, but permanent officers have not been chosen.

C. J. Wilson is president of the Pressed Steel Truck Co., Pittsburgh, recently incorporated to manufacture a new railroad platform and warehouse pressed-steel hand truck, the patent for which is to be issued this week. Offices of the company are in the Commonwealth building.

G. L. Sprague, formerly connected with Allis-Chalmers Co., West Allis, Wis, and recently head of the organization and efficiency work of the state board of public affairs in Worcester, has become superintendent of the steel fabricating plant of the A. E. Norton Co., Boonton, N. J.

F. E. Fotheringham, a prominent New York engineer, has been examining the properties of the Keewaten Power Co., near Kenora, Ont., and other power plants and iron deposits in the interest of a syndicate of eastern capitalists, who contemplate the smelting of iron ore by electricity.

John T. Dickerson, associate member of the American Society of Civil Engineers, has been appointed sales manager for the Strauss Bascule Bridge Co., Chicago, to succeed B. C. Bartram, resigned. Mr. Dickerson will have charge of the eastern territory and his offices will be in New York.

Thomas B. McNamara, who has been mining captain of the Aurora mine at Ironwood, Mich., for five

MEN OF THE IRON TRADE

years, has tendered his resignation to D. E. Sutherland, general manager of the Oliver Iron Mining Co. Captain McNamara has accepted a position with J. M. Longyear to look after the fee and royalty rights of Mr. Longyear on the Gogebic range.

W. P. Snyder, of Pittsburgh, president of the Shenango Furnace Co., has gone up the lakes on one of the large ore boats of the Shenango Steamship Co., accompanied by Col. J. M. Schoonmaker, vice president and general manager of the Pittsburgh & Lake Erie railroad. The party intends to visit the ore regions in the northwest.

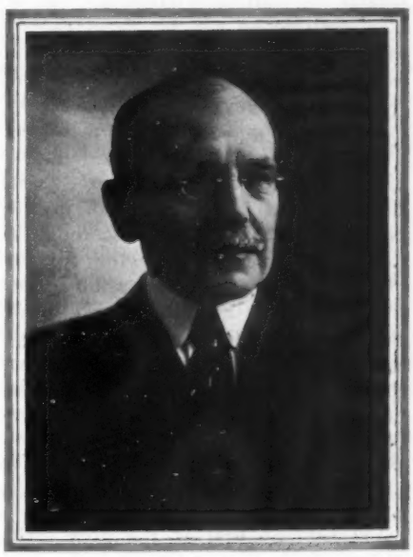
J. R. Sexton, master mechanic of the Missouri division and the Shopton shops of the Atchison, Topeka & Santa Fe railroad at Shopton, Ia., has been appointed mechanical superintendent of the western lines of the northern district with headquarters at La Junta, Col., to succeed M. J. Drury, promoted. J. P. McMurray has been appointed master mechanic of the Rio Grande division, with offices at Albuquerque, N. Mex., to succeed L. A. Mattimore.

J. Leonard Replogle, assistant to President Charles S. Price, of the Cambria Steel Co., has been placed in charge of manufacturing operations, sales, etc., of the company at Johnstown, Pa., following upon the illness of President Price. Mr. Replogle entered the employ of the Cambria company at 13 years as office boy, advanced through the various departments and March 15, 1910, was named assistant to the president, a newly-created office. He is 35 years old.

Sir Gilbert H. Claughton, Bart., chairman of the London & Northwestern railway, has been elected a member of the Iron and Steel Institute, to succeed the late Sir John Alleyne. Sir Gilbert Claughton is agent for Lord Dudley, controlling his extensive estates and iron works at Dudley. He was recently included among the knights created by King George V. Sir Gilbert is a prominent politician and an ardent tariff reformer, and has figured in several contests for a seat in parliament.

E. Roenius was elected president of the American Carbonic Machinery Co., at its recent annual meeting. The company was formerly known as the Wisconsin Ice Machine Co., and is located at Grand Rapids, Wis. Its corporate style was changed at the recent meeting. Other officers elected were vice president and general manager, J. C. Goosman; secretary, O. R. Roenius; treasurer, Oscar Uehling; additional director, Fred Roenius. J. C. Goosman is in charge of the sales department and is making plans for extending the scope of the Chicago sales office.

George I. Alden, formerly treasurer and secretary of the Norton Co., Worcester, Mass., and the Norton Grinding Co., and for many years business associate of the late Milton P. Higgins, has succeeded Mr. Higgins as president of both companies. Charles L. Allen, general manager of



FRED KREBS
He will retire as general sales manager of Cambria Steel Co. on Aug. 1.

the Norton company, has succeeded Mr. Alden, who is general manager of the Norton Grinding Co., as treasurer of both companies. Alden C. Higgins, son of the late Milton P. Higgins, succeeds him as secretary. Sanford Riley has been elected to the directorate of both concerns.

Fred Krebs, who is widely known throughout the iron and steel trade as general manager of sales of the Cambria Steel Co., has presented his resignation, effective Aug. 1. He will leave the Cambria company with the regrets of thousands of fellow employes. Mr. Krebs entered the employ of the Cambria at the age of 16 years and worked through the various supervisory positions in the Gautier works. On May 1, 1907, he was named general manager of sales for the company. He was elected a director in March, 1910. Mr. Krebs will continue to reside at Johnstown, Pa., for the present.

W. O. Worth has been elected president of the Railway Motor Car Co., Marion, O., recently incorporated to make motor cars for use in railroad section work. Mr. Worth, with J. D. Worth, Hiram Beschore, G. R. Stewart and Eben H. Wolcott, compose the directorate of the company.

E. J. Wehrly and George R. Lyon, president and vice president, respectively, of the newly organized Power Equipment Co., which has succeeded the power plant department of the Arbuckle-Ryan Co., Toledo, O., have been associated with the latter company several years. All unfinished power-plant construction contracts of the Arbuckle company have been turned over to the Power Equipment Co., which will continue as contracting engineer for the installation of complete power plants, and as sales agent for the Stirling water tube boiler, and the C. & G. Cooper Co. Corliss and uniflow types of steam engines.

R. J. Turnbull, acting superintendent of machinery of the eastern district of the Missouri Pacific-St. Louis, Iron Mountain & Southern railroad, with offices at St. Louis, has been appointed superintendent of the entire system, with offices in the same city. W. L. Tracy, assistant superintendent of machinery of the western district, with offices at Kansas City, Mo., has been appointed general master mechanic of the eastern district with offices at St. Louis. W. C. Smith, master mechanic, with offices at Kansas City, has been appointed general master mechanic. D. W. Cunningham, assistant superintendent of machinery of the southern district, with offices at Little Rock, Ark., has been appointed to general master mechanic of that district, and will remain in the same city. The office of superintendent of machinery has been abolished, and the duties hitherto assumed by that officer have been assumed by the mechanical superintendent.

Which is Better for Labor---Big or Little Business?[1]

Advantages Resulting from Manufacturing on a Large Scale—How the Workingmen Are Affected by the Great Industrial Changes of Recent Years

By James T McCleary[2]

The subject for discussion may be broadly entitled "Big Business and Labor." The topic having already been treated quite fully in detail as to one line of business, perhaps I can best make my modest contribution to the discussion by taking a general view. I shall try to look at the matter with the eyes of an earnest man who must earn his bread by the sweat of his brow. This should not prove a hard task for me, because work has been the experience of my life.

The Wage-Earner's Natural Desires

The things desired by me as a workingman may be grouped into two classes: First, the things desired now; second, those desired for the future.

What I desire first of all is employment, the chance to earn an honest living. That is the fundamental thing, compared with which all other considerations in this line are of minor importance. No one can fully understand the value of having employment who has not been under the necessity of walking the streets looking for work. Employment having been secured, the question of compensation assumes larger importance. Later on, as I become accustomed to having work at fair wages, the question of working hours may arise. Still later, I may come to attach importance to working conditions, whether they are safe or unsafe, healthful or unhealthful. I may inquire what provisions are made for the prevention of accidents, and how much of the inherent risk of the employment I should as a workingman assume.

Looking to the future, what do I naturally desire? My prime desire for the future is steadiness of employment, that I have opportunity to work as many months in the year as possible. Closely related comes the question of permanency. How many years can I count on having employment in this line? Can I count on finding in it a life-work, and prepare myself accordingly? How far does the employment offer opportunity for promotion, for getting on in the world? What chance will there be for me to become a partner? What provision for old age does the employment promise?

To me as a workingman which offers the more satisfactory answers to these vital questions, big business or little business? I cannot afford to make any mistake about this matter.

First, as to my chance of employment: What I as a workingman offer in the market is the most perishable of all commodities. If a man desiring to sell his farm cannot find a buyer today, he may find one next month or next year. Meantime the property may actually increase in value. The goods that a merchant does not sell today, he may hope to dispose of tomorrow or next week. But the man who goes forth in the morning with a day's work for sale must sell it that day or the coming of sunset finds it lost wholly and forever. So to me as a workingman the first imperative need is employment. Which offers me the better chance for securing employment, big business or little business?

Big Business Enlarges Opportunity for Employment

Let us look first at the great field of transportation. Up to about a hundred years ago all the centuries had failed to develop any means of transportation aside from animal power of some kind, except the uncertain use of wind-power on some waters. It is only about 80 years, within the lifetime of many men still among us, since the railway came into being. Prior to the railway the acme of land transportation was the stage coach. That was the day of small things. The coming of the railway was practically the beginning of big business. How has its coming affected the opportunity for getting employment in transportation?

It is part of the law of progress that the superior shall displace the inferior. So the first effect of the railway was to drive out of business the stage coach and the wayside inn, with all that they implied in the line of employment. Since 1830, when railroading began, the population of the United States has increased sevenfold. But during that period the number of our people employed in transportation has increased more than a hundredfold. In other words, in the field of transportation the coming of big business in this country has multiplied each man's chance for employment by more than 12.

Big Business and Labor

How about other crafts? When the spinning of yarn and the weaving of cloth was done by hand, few people were able to find regular money-making employment in those trades. Such inventions as the spinning-jenny and the power loom vastly increased each person's chance for getting employment in making cloth. The invention of the sewing machine has largely increased, compared with the increase in population, the number of persons regularly employed in making wearing apparel. The making of garments has become big business in large part, and in that part affords to each person more opportunity for work than was offered in the days of little business in this line or is afforded now in that part of the garment-making field occupied by little business. The invention of the telegraph and that of the telephone have not only increased very greatly the chance for work in transmitting messages, but have practically opened an entirely new field of employment. Both are chiefly operated as big business. The improvements in paper-making, in typesetting and in printing generally have resulted in big business in nearly all these fields and at the same time have vastly increased the number of persons employed in paper and printing industries.

Except the telegraph and the telephone, these improvements and others that seemed to compete with existing methods, were all opposed by wage-earners at the time of their introduction on the ground that they would rob the people of employment. On that ground the early machines were destroyed by those whose earn-

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[1]Abstract of an address delivered at the annual meeting of the American Academy of Political and Social Science, Philadelphia, 1912.

[2]Secretary American Iron and Steel Institute.

ings seemed to be threatened. They honestly thought that "labor-saving machinery" meant the employment of fewer workers. But it is coming to be understood that, while improved methods of production do at first reduce employment in specific cases, their ultimate effect is to increase employment.

The Mother of Employment is Efficiency

And the reason for this seeming paradox is coming to be understood. It is that by scientifically reducing the cost of products the good things of life are brought within the reach of many more people, the market for them is thus greatly enlarged and the vastly increased volume of consumption in turn increases the demand for labor. In the stage coach days a journey of a hundred miles was an event, one that came to the average person hardly once a year. Indeed, to most people it never came. Today a trip of a thousand miles is simply an ordinary matter, and people encircle the earth for a vacation. For every person who in the old days traveled a hundred miles, scores now travel a thousand. For every person who, in the old days of hand weaving and hand sewing got one new suit or dress a year, a hundred now get two or more new suits or dresses a year. For every person who in the old days took in all one weekly paper, hundreds now take dailies and weeklies and monthlies; and the number of books in the average home has increased enormously.

The average man of today can command comforts and conveniences that were beyond the reach of kings even a century ago. How have the good things of life been brought within the reach of so many of our people? Primarily by increased efficiency in production and distribution. This efficiency has been secured in large part by utilizing more and more the forces of nature and by production on a large scale, thus making it possible to reduce very greatly the necessary margin of profit on each item.

Efficiency helps to enlarge employment. Big business promotes efficiency. So big business helps to enlarge employment.

Big Business Improves Labor Conditions

Returning now to my theme, it seems clear that as to opportunity for employment big business offers me as a workingman more chance than does little business. How about the next item, wages? Let us again begin our investigation with transportation. How do the wages earned today by engineers and firemen, by conductors and brakemen, by train dispatchers and station men, by railway employes generally, compare with those that were earned in the transportation field in the days of small things, the days of the stage coach? Ask any elderly man who has personal knowledge of conditions then, and he will tell you that the lowest wages now paid by the railroads are higher than the highest that were paid to transportation men in the stage coach days. Not only are the railroad employes paid more dollars per week than were paid to the corresponding employes on or about stage coaches, but as to most things each dollar will buy more now than it would buy then. And today, where are the highest salaries and wages paid? Are they not paid by the larger companies? As is admitted even by critics of the United States Steel Corporation, wages in the steel industry have increased 25 per cent since the organization of that company. On the score of wages, then, big business seems to promise me more than does little business.

The other working conditions, those relating to healthfulness and safety, have already been so fully discussed today that I shall merely refer to them very briefly. To render conditions of labor healthful and safe costs money. Only companies of considerable capital can afford to make such provisions for health and safety as every right-minded employer would like to have. And it is only when plants attain considerable size that it becomes practicable to assign one or more capable persons to the special duty of looking after such conditions of work. Moreover, public opinion is a great regulator. But the general public takes little interest in small plants, while on big ones is turned the searchlight of publicity. Conduct which in small companies does not even cause comment is severely criticized and condemned in large companies. The larger the company the more care it must exercise to avoid unfair criticism. And last but not least is the disposition of the men at the head of big companies. Most men would rather be kind than unkind. But in the severe struggle of life men often feel under the necessity of being more harsh than they really wish to be. The men at the head of big business are sufficiently far removed personally from the temptation to harshness, and yet can remember the severity of the average man's struggle, that they have both the disposition and the ability to be especially considerate of their less successful brethren. One of the real difficulties met by these men is that of knowing what is actually being done or left undone by their subordinates. But that problem, too, is being solved.

Big Business Promotes Steadiness of Employment

And now, which holds out to me more promise for the future?

How about steadiness of employment? I have learned that alternate chills and fever undermine health. I do not crave a life of alternate feast and famine. As I figure the matter, it is better for me to earn $1,000 a year working 50 weeks and having two weeks of vacation than to earn $1,200 a year working 20 weeks and having 32 weeks of vacation. In the one case I get about $20 a week. By living sensibly I can keep within my income and even save a part of it. In the other case I would be getting $60 a week while at work. I would probably feel rich and act rich. I understand human nature well enough to know that during the income period I would probably key my expenditures to at least a $30-to-$40-a-week rate. Even at this seemingly moderate rate my income would not see me through the year. To every person idle time brings special temptations. It is for idle hands that "Satan finds some mischief still." Holidays are proverbially hard on savings. So I have soberly concluded that on the whole for me as a workingman steadiness of employment is even more important than rate of wages.

Which offers me more promise of steady employment, big business or little business?

Little business is necessarily local in its operation and seasonal in its demands. This week there may be a rush of orders; then may come a long period of slackness in demand. Big business, on the other hand, usually covers in its operations a large area with its varying needs, and thus has better opportunity than little business to secure continuity of demand. And in case of temporarily slackened demand, big business can afford better than little business to pile up goods for future requirements. Thus, with broad vision and an extensive field of operations, backed by large capital, big business can more effectively than little business equalize its volume of production during the year and can thus render employment more steady. Of course no company or corporation, big or little, can guarantee steady employ-

ment to every one on its rolls; but it seems clear that employment is more likely to be steady in big business than in little business.

Big Business Affords More Opportunity for Promotion

But it is often asserted that big business is closing on young men the door of opportunity. My judgment as an observing wage-earner is that such an assertion is contrary to reason and disproved by experience. The very permanence of employment afforded by big business gives opportunity to devote time and money to fitting oneself for larger usefulness and greater responsibilities. And the magnitude of the possible rewards is an incentive to ambition. What does experience show? Take the men in high positions in big business—in manufacturing, in railroading, in banking, in merchandising or in any other line—what is their history? Nineteen out of twenty of them rose from the ranks.

But is the way still open? Never so wide open as now. Looking back over my boyhood days, I see each business owned by the man at the head of it. In most cases this man had founded it, and one of his most cherished ambitions was to transmit the business to his descendants, so that generation after generation it should bear the family name. This was a most praiseworthy ambition, and the working out of it often resulted in great good. But with the owner so minded, what chance had any boy outside of the owner's family to get to the head of that business? Little, unless the sons turned out badly, an undesirable thing. And new establishments could then be started with less capital, perhaps, than now. But, as we have seen, it is in just such small enterprises that most of the failures come.

There are 20 times as many chances for a man to reach a commanding place in the community, with an annual income of $5,000 to $50,000 or more, now than there were in my boyhood. Why is this? The funds to operate big business are gathered from thousands of sources. The men at the head of large enterprises are not the sole owners but are trustees for the owners. To attain such positions of trust they must command confidence. To maintain their standing they must show results. Unquestioned character and demonstrated capacity are their keys to the doors of progress and promotion. The head of a big business, with his great responsibilities, would hesitate to place even his own son in one of its important positions until the young man had given evidence of fitness for the work. Favor counts for less and merit counts for more in business now than ever before. This has been brought about by big business. So for me as a workingman, ambitious to rise on my own merits, big business offers better opportunity and more of it than does little business.

Ownership in Big Business Easier to Get and Safer to Have

But in days gone by young men did sometimes become partners. Certainly, and so they do today and more frequently. In the old days a partnership depended largely on the will of the owner. The employe had little voice in the matter. And this was right. Partnership is at best a very dangerous method of combining capital. In partnership each partner has full authority to act for and bind the firm. Conversely, each member of the firm is responsible for all the debts of the firm. With the best of intentions one's partner may make a mistake which will not only cause the loss of all that one has invested in the business but may also wipe out all one's other property. But the ownership in corporations is divided up into shares so small—usually $100 each—and the shares of the large corporations are on sale every day, that any employe can become a part owner in even the largest company to the extent of his desires and ability. And this he can do much more safely than in a partnership. He takes no risk beyond his investment. And as the newspapers show day by day the market value of the stocks he can sell his stock or buy more whenever he wishes to do so. Many large corporations offer to their employes special opportunities for becoming owners of their stock. So that as a workingman I can today become one of the owners in big business more easily and more safely than I could or can in little business.

And now finally how about provision for the time when I can no longer work? Fear of want in old age is the nightmare of perhaps the majority of civilized men. To lay by a competency for the evening of life prompts much of human effort. The love of money is no doubt the root of much evil, but usually that applies to money sought for present gratification. The desire to provide for old age is the root of much of the honorable effort of life, and lies at the base of much practical virtue. Which offers me better opportunity for peace of mind about old age, big business or little business? The answer is obvious. All that has thus far been said indicates what that answer must be. But in addition to all that, many companies make definite provision for the retirement of employes who have rendered long and faithful service on a pension that shall secure them from anxiety about income during their declining years. But such provisions are being made only by large corporations, and in the nature of the case cannot be made by any other.

So that, after calmly surveying the field, it seems clear that both for the present and for the future big business offers me more as a workingman than does little business.

MAY TAX MINES

Minnesota Mining Town Hits Upon Plan to Increase Revenue.

Virginia, Minn., July 22.—The city of Virginia is seeking increased revenue from the iron industry, to which it owes its existence. An effort to annex 1,280 acres lying directly east of the city is being made. The area contains, among other mines, the Union, Norman, Virginia, Franklin and Lincoln, some of the largest producers on the Mesabi range, valued at approximately $12,000,000. The United States Steel Corporation and the Jones & Laughlin Steel Co., Pittsburgh, will be affected if the proposed plans materialize. The question is pending before the board of commissioners of St. Louis county, and will probably go to the courts before it is settled.

Operations at the International Harvester Co.'s Hawkins mine at Nashwauk, Minn., were never more brisk than at present. A force of 175 men is at work both day and night, and five steam shovel crews are employed. The concentrating plant is giving excellent satisfaction, and is washing 5,000 tons of ore a day. There has been difficulty in procuring enough cars, although the arrival of 1,000 new cars ordered by the Great Northern, will afford the mines more adequate service. The Euclid mine, on the shores of Longyear lake, in the Chisholm field, has reverted back to the White Iron Lake Mining Co., the sub-lease held by the Euclid Mining Co., of which A. B. Coates, of Virginia, Minn., is president, having been surrendered. The property entered the producing list in 1909 and has shipped to date about 200,000 tons.

The Dayton Engineering Laboratories Co., Dayton, O., has increased its capital stock from $250,000 to $350,000.

FEE OWNERS

File Suit to Regain Norman Mine—Heavy Damages Asked.

The fee owners of the Norman mine brought suit at Duluth last week, against the Oliver Iron Mining Co., for $1,012,250 and possession of the premises. The allegations in the petition are haphazard mining operations which resulted in the wrecking of the mine and heavy loss of life, and general mismanagement of the property. The mine is located on the Mesabi range, near Virginia, Minn., and is a part of the Virginia group.

The complainants are the Leon Iron Co., the Higgins Co., the Gilbert Investment Co., Clara A. H. Smith and Frank Sullivan Smith. The Oliver company is the mining organization of the Steel Corporation.

The suit follows a notice of cancellation of the lease served on the mining company by the fee owners several months ago, shortly after an accident at the mine. The mine has not been released to the fee owners. The monetary damages sought in the suit are asked as restitution for the alleged damages to the mine and the costs.

In the complaint it is cited that as a result of the "reckless methods" of mining more than 410,000 tons of merchantable ore, valued at $420,250, has been left hanging on the sides of the mine in such a manner that it could not be mined with safety to the miners. It is claimed that there have been a number of cave-ins at the mine within the past few months, resulting in the loss of nineteen lives.

It is further claimed that the mine has been left in such a condition that $100,000 would have to be expended to reach the ore, which the fee owners claim has been allowed to mix with the rock and earth.

The allegations against the Oliver company were not given serious consideration by mining men when the cancellation notice was filed, as the company's mining methods are known to be anything but "haphazard." It was stated at the time that the company had followed its usual careful mining methods in its operations at the Norman and surprise was expressed at the sweeping allegations made by the fee owners.

The Norman mine has been owned by the plaintiffs in the suit for a number of years, the property being taken over in April, 1893, from the Rouchleau-Ray Iron Land Co. At that time the leases were owned by the Norman Iron Co. Ten years ago the company assigned its lease to the Oliver company, which has since operated the mine.

WIRE COMPANIES

May be Merged by Imperial Steel & Wire Co.

Toronto, Can., July 23.—The Imperial Steel & Wire Co., of Collingwood, may head an amalgamation of wire concerns, according to reports being circulated here. The merger would include three independent wire mills. President J. A. Currie, president of the Imperial company, states that there is some truth in the reports, as negotiations are under way for the acquisition of other mills by his company, but that matters are not far enough advanced for the publication of details.

The Imperial company recently paid a 20 per cent dividend and has enlarged its preferred stock capital by $300,000. It has no bond issue or other fixed charges and is in an excellent position to carry out the project.

At a recent meeting of Canadian manufacturers of wire nails, the list of extras was changed. Everything in the 5 and 6-inch list were made the base; all in the 4-inch class were advanced 5 cents, and in the 3-inch class, 10 cents per keg.

Begin Work on Dock

Toronto, Can., July 23.—Work has been started on the $1,000,000 floating dry dock at the Polson Iron Works, Toronto, by John E. Russell, who has the pile-driving contract. It is hoped to have one section finished this fall and the entire dock completed by next spring. Special machinery is now en route from Scotland and includes a multiple punch 60 feet long and weighing 46 tons, with a capacity of 480 holes per minute, and a large traveling crane. Centrifugal pumps that will empty the dock of water in 20 minutes, are being built here.

Shipbuilders Busy.—A huge demand for steel has followed the boom in English shipbuilding. On June 30, there were 529 vessels, representing 1,774,040 tons, under construction in Great Britain. This surpasses the record a year ago by 3,000 tons and is 87,000 tons over the March record. The warship tonnage is 503,000 tons, 58 ships being under construction at the end of June.

ATTACK RATES

On Cast Iron Pipe, Bridge and Structural Material.

Washington, July 23.—Rates on bridge and structural material from Massillon, O., to points in Oklahoma are alleged to be "excessive, unjust, unreasonable and unduly discriminatory" in a complaint filed by the Massillon Bridge & Structural Co., Massillon, O., with the Interstate Commerce Commission. The railroads cited in the petition are the Pennsylvania, Vandalia, St. Louis & San Francisco, M., K. & T., and the Fort Smith & Western. Reparation to the amount of $643.60 on 22 shipments is asked.

The company in its complaint suggests new rates as follows: Massillon to Mannford, Depew, Gristow, Kellyville, Kiefer and Paden, 66 cents per 100 pounds; to Sapulpa, 60 cents on shipments prior to Aug. 10, 1910, and 60 and 54 cents for the future; to Cushing, 66 cents.

Allegations in the petition that rate adjustments are made with a view of aiding certain large steel makers promise to make the hearings interesting.

The waterworks authorities of Fort Smith, Ark., have also challenged the reasonableness of rates on cast iron pipe from Chattanooga, Tenn., and ask for reparation to the amount of $2,112 from the Southern, Frisco and other participating carriers. They declare that on certain shipments they paid a rate of $6.85 per net ton, while at the same time Kansas City was able to get cast iron pipe from Chattanooga at a rate of $5.95 per net ton. The rate attacked applies also from Anniston, Bessemer, Birmingham, Gadsden, Holt and North Birmingham, all situated in Alabama.

Coke and Coal Shipments Increase

June shipments of anthracite coal on the Pennsylvania lines east of Pittsburgh and Erie, were 883,326 tons. The total for the six months was 4,572,269 tons, a decrease of 1,463,631 tons. Bituminous coal shipments for the six months were 22,519,781 tons, an increase of 2,771,068 tons compared with the first six months of 1911. Coke shipments for June were 1,033,381 tons, an increase of 236,946 tons. The six months' shipments of coke were 6,374,293 tons, an increase for the six months of 1,125,744 tons. The report shows the rapid recovery being made from the effects of the strike in the anthracite regions.

COMMERCE COMMISSION

Will Inquire Into Middle Western Rates on Steel Products.

Washington, July 23.—The Interstate Commerce Commission has ordered a general investigation into the rates and practices, rules and regulations governing the transportation of iron ore, cement, iron and steel and their products in the territory east of the Mississippi and north of the Potomac and Ohio rivers. The action was taken in response to formal and informal complaints that have been made to the commission.

That the inquiry is to be searching and complete, is evident from the language employed in announcing, to the railroads in the territory affected, the intention of the commission. The investigation promises to equal and probably excel in importance the express company inquiry. Hearings will not begin until this autumn.

Stories of discrimination against independent steel men, independent coal and coke operators, have been told to the commission and complaint made by these independents that there is a community of interests between the Steel Corporation and the common carriers. Behind the announcement of the investigation is believed to be the intention of the commission to discover the truth or falsity of the charges that the Corporation is able to do business at rates and under conditions which enable it to prosper notwithstanding its high capitalization, while the success of the independents is only moderate.

Assertion has been made to the commission that rates are so adjusted in the whole territory and to points outside, as to give the various allied interests an advantage over competitors. It is claimed that rates are made with a view of benefiting plants, of the alleged allied interests, which plants in case are the only ones in the geographical place described and, therefore, the only ones that can derive benefit from the carefully adjusted rates.

The following excerpt from the order shows the extent to which the investigation will be carried:

"That said inquiry shall ascertain whether any common carrier subject to the act to regulate commerce, as amended, owns or has any interest in, by means of stock ownership in other corporations or otherwise, any of the above-named articles which it, directly or through other companies which it controls or in which it has an interest, transports over its line as a common carrier, or in any manner owns, controls, or has any interest in mines from which iron ore is taken; whether there is common ownership or control of, or interest in, directly or indirectly, by means of stock ownership in other corporations or otherwise, any common carrier and the mining or production of any of the above-named articles; and whether persons, firms, or corporations having substantial interests in the one, by direct ownership or the holding of stock or securities of common carriers, corporations mining or producing the articles above named or other corporations, or otherwise, occupy, or are represented by persons occupying positions of control in the other.

"That said proceeding and inquiry be conducted with a view to the issuance of an order or orders requiring the respondents herein to cease and desist from charging, demanding, collecting, or receiving rates and charges for, and from enforcing their practices, rules, and regulations governing the transportation of said commodities, in so far as the same may be found unlawful, and requiring such respondents to establish such rates to said destinations and such rules, practices, and regulations relative to the transportation of the same as may be found just and reasonable, and not unjustly discriminatory."

Charter New Railroad

Toronto, Can., July 23.—A fourth Canadian transcontinental line of railway is projected connecting Fort Churchill on Hudson bay, with Port Essington on the Pacific coast, by way of Edmonton, Lac La Biche, Fort McMurray and Lake Athabasca, a total distance of 1,450 miles. The Northern Territorial Railway, which is backed by British capital and is capitalized at $40,000,000, was chartered at the last session of the Canadian parliament with bonding powers of $40,000 per mile. It is stated that surveys will be begun northeastward from Edmonton in a few days, and it is expected that grading will be started before the close of the season.

Busy on Locomotives.—During the past three months the Chicago, Milwaukee & St. Paul railroad has built 40 engines at its West Milwaukee shops and is now constructing 40 more, enough to keep the shops busy until December. It is reported in Milwaukee that the road has placed an order for 110 locomotives with the American Locomotive Co.

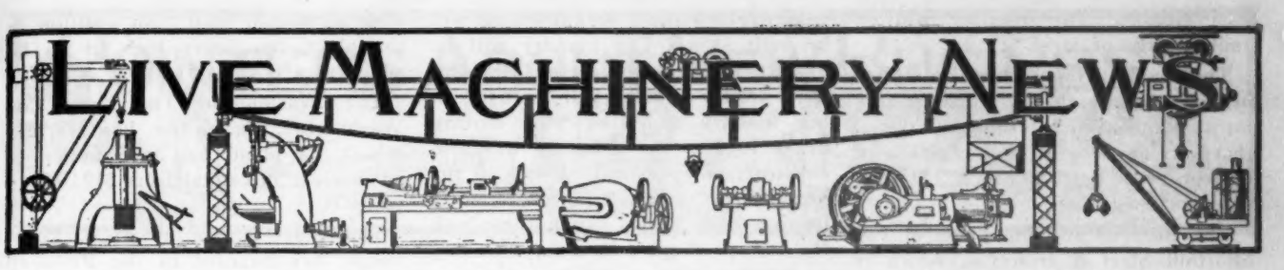
BRITISH IRON TRADE

Mills Were Never so Congested and Prices are Firm.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., July 13.

Pig Iron.—The quarterly meetings have brought no great addition to the amount of pig iron business. One reason is a certain amount of fluctuation in Cleveland prices, through speculative operations. There was a fall on one day this week of five pence per ton, bringing warrants to 56s 2d ($13.74) for prompt cash. But yesterday's figure was 56s 5d ($13.80) with 57s 5d ($14.02) three months, figures which show a fairly strong market. There is a good deal of scarcity of material, and smelters are obliged to divide their output into small lots to satisfy the urgent wants of consumers. The amount in store at Cleveland is now 300,000 tons. The Cleveland market will be unsteady for a short time, owing to a good deal of realizing by speculators before the holidays. In the meantime contracts are running low, and there must be a great buying movement, especially with the arrival of August, when contracts must be extensively entered for autumn requirements.

Finished Material. — There is no slacking off in any branch of the iron and steel trade. In the Sheffield district, the greatest pressure is being experienced. Nobody is wanting new business, and all the rolling mills are very much in arrears, especially on small lots. A large number of works extensions are in progress in that district. Consumers pay the advanced rates quite cheerfully, as they have no difficulty in recouping themselves from their customers. Tin plate prices are about a shilling above the quotation of three months ago. Semi-steel continues about £6 for Bessemer, and from half a crown to five shillings more for Siemens. For the small quantity of Belgian material on offer 1s 6d more per ton was asked than in the previous week, while finished bars from the same source were half a crown dearer. Of the iron and steel trade generally, it may be said that makers could take much larger orders if they cared to do so. But, quite commonly, they cut down offers to a third or a fourth when the business comes to be booked. Where they are ready to guarantee delivery, price seems to be a secondary consideration. Galvanized sheets are still the weakest item on the market, and prices are a shade easier. It is possible to buy at £11 17s 6d f. o. b.



In New York, the volume of machinery orders and prospective business continue to expand. While the improvement is most noticeable among sellers of machine shop equipment, all lines of mechanical apparatus are enjoying a satisfactory period of activity. New business and inquiries of the past week consist of numerous small orders and specifications for replacement machinery and units for enlargements of plant capacity. Upon the request of several concerns the date of closing bids on the Lima Locomotive Corporation list was extended several days. The company already has closed for a part of its equipment, consisting of from 10 to 12 electric traveling cranes of the Shaw type. The order was placed with Manning, Maxwell & Moore, New York City, and was one of the largest crane orders taken for some months.

In Pittsburgh estmating is keeping up among the machinery men and considerable new business is in sight with a very large increase in the chilled roll trade, due to the unusual activity among the mills. Prices are somewhat more satisfactory, and machinery men say that the run of small orders is larger, and the aggregate of new business is filling them up quite comfortably for some time, but there is still spare capacity that can be utilized. This will not exist for any great length of time at the present rate that orders are coming in.

In Cleveland, a fair volume of business continues to be enjoyed among machine tool dealers. Although most of them say July will not equal the preceding month in the aggregate amount of business, the trade at present is much better than it was in March, April or May. Scattered inquiries for all lines of tools are coming in, and a number of sales of milling machines, drilling machines, cutting machines and lathes are reported for the past week. Power plant equipment has been in fairly good demand; this is especially true of motors. Second hand tools continue to be sold at a fairly heavy rate—the result of an unusually large offer made by one of the supply houses. Dealers seem well pleased with prices.

In Cincinnati the machinery market is holding well, but it has not improved to any noticeable extent recently. The inquiry of the Lima Locomotive Corporation, Lima, O., has given a little better feeling to the market as it is probable that a proportionate part of the 200 tools to be bought will be placed among local makers. The noticeable feature that business is not very evenly distributed among the different machine tool plants still continues, for while some are doing a good business, others in the same line are suffering for lack of orders. Lathes appear to be selling better than any of the machine tools, and the local manufacturers of electrical machinery are doing a better business than at the corresponding time last year. The long expected buying by the railroads has not come, and it is likely this will be put off until the first of next year.

Power Plant Equipment

W. F. Richardson, P. W. Holman and others, who have purchased the electric light plant at Glasgow, Ky., from Bowen Bros., will install additional machinery in the near future.

H. Reaves, Greenville, Tenn., is asking for prices on equipment to be installed in an electric light plant. Generators, engines, switchboards, etc., are wanted.

It is officially announced by J. G. White & Co., Inc., 53 Exchange place, New York, that plans have been prepared for the construction of an extensive hydro-electric plant for the Augusta, Aiken Railway & Electric Corporation, including the expenditure of approximately $2,500,000. The plans include the following: A development dam of concrete; total length 2,300 feet, spillway 2,000 feet, average height 34 feet, and a power house, 360 feet long, with initial installation of five units of 9,000 kilowatts capacity. The ultimate capacity will be raised to 18,000 kilowatts. It is understood that the construction work will be done by the engineering company. The plant will be located at the mouth of Stevens creek, about eight miles from Augusta, Ga.

Water Works

Whitley City, McCreary county, Ky., is contemplating the erection of an electric light plant and a water-works system.

Machine Tools

L. R. Veatch, who has a plant at First and A streets, Louisville, Ky., for the rebuilding of flour milling machinery, plans to enlarge it, and will require some machine tools.

The International Typesetting Machine Co. recently ordered 14 Cincinnati milling machines for installation in the new factory at the foot of Kemsen street, Brooklyn, N. Y. Other specifications are before the trade for equipment for this plant, which probably will be closed on in the near future. It is expected by the officials of the company that operations will begin the latter part of August.

New Construction

The M. W. Kellogg Co., Jersey City, N. J., has just commenced work on the construction of a 70 x 105-foot extension to its gray iron foundry.

The Drop Forging Co. of New York, Jersey City, N. J., is planning to increase its capacity within the next few months.

The A. B. See Electric Elevator Co., Jersey City, N. J., is erecting a 118 x 118-foot addition, one story and balcony, to be used as a combined pattern shop, carpenter shop and pattern storage.

The Athol Machine Co., Athol, Mass., iron founder, advises that its proposed new building will be 60 x 142 feet, three stories, and of brick and concrete construction.

Plans are being prepared for a 2-story brick and steel factory addition to the Meadville Malleable Iron Co., Meadville, Pa., to cost $10,000. E. J. Weaver, of Meadville, is the architect.

The Vulcan Iron Works, Wilkesbarre, Pa., will erect, in the near future, an office building to cost at

least $100,000. The structure will be built mostly of steel.

The Eagle Iron Works Co., Minneapolis, has purchased a quarter-acre lot at Ninth avenue S. and Fifth street, that city, and will build thereon a cement brick building, 44 x 140 feet, two stories.

The material for the plant of the Shorthill Steel & Iron Co., which is removing its shops to Perry, Ia., from Marshalltown, Ia., has arrived and 300 men are at work on the plant, which will cost $175,000.

F. W. Van Loon has been awarded the contract for the foundry building to be built at Holmesburg Junction, Pa., for the American & Manganese Bronze Co. The building will be one-story in height and will measure 50 x 120 feet. It will be built of corrugated iron.

The Geneva Metal Wheel Co., Geneva, O., advises that it expects to build an addition to its plant to have dimensions of 100 x 195 feet. About one-half of this building is to be used for a foundry and the other half for a finishing room. The company will not be in the market for much machinery other than a cupola and blower.

The Geo. A. Fuller Co. has received the general contract for the erection of a large addition to the plant of the Hale & Kilburn Mfg. Co., at Eighteenth street and Glenwood avenue, Philadelphia. The plans provide for a six-story, steel and concrete structure, 120 x 279 feet, to cost about $250,000. The American Bridge Co. has the contract for the steel work of the extension.

The Roche-Bruner Building Co., Cincinnati, has secured the contract for the construction of the new plant of the Crane-Hawley Co., that city, which will be located at Broadway and Ninth streets. The building will be 152 x 152 feet in dimensions, and the cost will be about $250,000. It will be five stories high and of steel construction. About 150 tons of steel will be used.

The Hercules Mfg. Co., Centerville, Ia., has made plans for the erection of its new works on a site just north of the C., B. & Q. railroad shops. Work will be started on the buildings as soon as possible. It is expected to complete three buildings by October, and the building of the fourth will be done during the winter, or possibly deferred until spring. The buildings will be of steel, brick and concrete. The largest will be 40 x 350 feet and will comprise the machine, blacksmith and paint shops and finishing and shipping rooms. The steel foundry will be 50 x 150 feet and the office building 40 x 50 feet, two stories. These will be erected first and the woodworking shop, 40 x 150 feet, will be built later. The foundry will be modern in every respect and the Coburn trolley system will be used in the foundry and shops for moving heavy loads. The company will also construct an industrial railway on the grounds for transporting material, a narrow gage track running through the various shops with sidings leading up to the railroad switch.

Miscellaneous

The Hudson Iron Foundry, Lewis Bros., proprietors, Jersey City, N. J., has just finished the installation of a new 56-inch Whiting cupola, which replaces the old cupola. The first heat was run off last week.

The Hackney Mfg. Co., St. Paul, Minn., contemplates the installation of tensile and traverse testing machines. Correspondence also is solicited from manufacturers of vacuum steam heating systems.

The plant of the Wilkoff Bros. Foundry Co., Youngstown, O., was badly damaged on July 17, when an electric storm swept over that city. The loss is estimated at about $10,000.

A 500-ton hydraulic press, built by the William Tod Co., Youngstown, O., has just been installed by the Canada Forge Co., Ltd., Welland, Ont. Furnaces to go with this press and a 10-ton electric crane to serve it were also installed.

The Nashville, Chattanooga & St. Louis railroad, with headquarters at Nashville, Tenn., will build shops and round houses at Paducah, Ky. The company has small repair shops there now, and these will be greatly enlarged.

The Armstrong Cork Co., Pittsburgh, has awarded contracts for its proposed 10-story warehouse in Pittsburgh, and will push this improvement rapidly, announcing further contracts for equipment, power and light facilities in the immediate future.

The American Sheet & Tin Plate Co., Pittsburgh, is remodeling the Old Meadow mills at Owensdale, Pa. A new engine is being installed, and several of the sheet and pair furnaces rebuilt. The improvements will be completed in the fall.

The Cincinnati Planer Co., Cincinnati, has recently purchased a number of direct current reversible interpole motors for direct connection to planers from the Triumph Electric & Ice Machine Co., Oakley, Cincinnati.

The Carnegie Steel Co., Pittsburgh, has ordered a 160-foot crane runway at the McCutcheon mill on the north side, Pittsburgh, and is taking estimates on a 10-ton traveling crane with an 80-foot span. An addition to the plant, one story high, is to be added at a cost of $12,000.

The Washington Tin Plate Co., Washington, Pa., which has recently rebuilt its plant, has filed notice of an increase in capital from $192,000 to $400,000.

The James H. Matthews Co., Pittsburgh, has awarded to the Brownell Co., Dayton, O., a contract for two 90-horsepower return tubular boilers. The Bonnell Co. has also taken orders for boilers for the new Jerome shaft of the Jenner-Quemahoning Coal Co., Jerome, Pa.

The Parish Mfg. Co., Reading, Pa., has placed a contract with the Rockwell Furnace Co., 26 Cortlandt street, New York City, for the installation of an over-fired, car type heat-treating furnace. This is the fourth furnace that the Rockwell company has installed in this plant.

The Westinghouse Electric & Mfg. Co., Pittsburgh, recently has booked orders for 10 quadruple, 343 double and four single equipments for traction car motors, the orders coming from San Francisco, Coffeyville, Kan.; LaGrange, Ind.; Philadelphia, Omaha and Cuba. The orders are indicative of the large street car business that has been steadily flowing into this company's shops.

The Grafton Mfg. Co., Martins Ferry, O., is to increase its capital stock and enlarge its plant for the manufacture of cornice and roofing material. The company is considering removing from Martins Ferry, but its plans are still indefinite. The local interests at Martins Ferry are endeavoring to subscribe the increased capital necessary and retain the plant in that town.

The George M. Newhall Engineering Co. is in receipt of an order from the Pennsylvania Railroad Co. for 10 wrecking cranes, 120 tons capacity each, with special features specified by the railroad company. The cranes will be manufactured by the Industrial Works, Bay City, Mich. This is the first order for equipment of this character placed by the Pennsylvania Railroad Co. for several years.

The Quinsigamond Pressed Steel Co. recently bought the personal property of the John L. Parleer Co., ferrule manufacturer and sheet metal stamper at the corner of Jackson and Lagrange streets, Worcester, Mass., which went into bankruptcy, and will move its business from Cambridge street to the Parker plant. William J. Words, of the Pressed Steel company, has bought the Parleer property, which comprises buildings and land.

New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

Rochester Pressed Steel Co., Rochester, N. Y.; $10,000; iron, steel, manganese, copper; by W. H. Gorsline, S. W. Gorsline, J. C. Dryer.

August Fetue & Sons Co., Buffalo; $50,000; iron, steel and other metals; by August L. Fetue, George R. Feine and Charles F. Feine.

The Independent Harvester Co. of Missouri, Kansas City; $20,000; by J. F. Thompson, W. W. Crimmin and H. M. Jones.

Shepherd & Schelhorn Co., Evansville, Ind.; $1,000; to manufacture stoves; by directors, J. T. Shepherd, C. F. Schelhorn and Carrie Schelhorn.

The Portage Electric Light & Power Co., Portage, Columbia county, Wis.; $50,000; by R. E. York, G. E. York and John A. Raup.

United States Steel Hoop Co., Boston; $500,000; by president, J. J. Conroy; treasurer, Winthrop S. Fawcett; director, W. M. Townsend.

A. F. Ward Machinery Co., Boston; $15,000; by president, J. S. Gravely; treasurer, Ashley F. Ward; director, O. W. Smith.

The Prince-Groff Co., Camden, N. J.; $125,000; mechanical and electrical engineers, machinists, etc.; by Lawrence M. Verga, John A. McPeak, I. C. Glow, 411 Market street, Camden.

Anti-Friction & Power-Saving Railway Truck Co., Paterson, N. J.; $125,000; to manufacture iron, steel, etc.; by Clemens Schnell, William S. Maxwell and William J. Barbour.

The Elliot Woodworker, Ltd., Toronto, $40,000; to manufacture woodworking and other machinery; provisional directors, Wm. A. Elliot, Armour A. Miller, and Glen W. Elliot.

Jenney Electric Starter Co., Indianapolis; $100,000; to manufacture electric starters for automobiles; by directors, C. D. Jenney, Russell Wilson and W. L. Taylor.

Pfau Mfg. Co., Milwaukee; $25,000; to manufacture pumps and pumping engines and accessories; by Otto R. Pfau, John R. Ball and John H. Harley.

The Fuel Economizer Co., Ltd., Hamilton, Ont.; capital $25,000; to manufacture stoves, furnaces, etc.; provisional directors, George W. Morgan, Alfred T. Bratton, James M. Jones and others.

Sparks-Withington Co., Ltd., Walkerville, Ont.; capital $40,000; to manufacture vehicles, automobiles and vessels; provisional directors, Wm. Sparks, Phillip H. Withington and John H. Coburn.

Oklahoma City Steel & Wire Works, Oklahoma City; $1,000; by directors, A. G. Sutherland, E. Sutherland and P. J. Hodgins of Oklahoma City; R. J. Sutherland and A. G. Sutherland, of Kansas City.

The Aughe Plow Co., Dayton, O.; $15,000; to manufacture agricultural implements; by Daniel J. Harstman, Fred W. Holt, Edward H. Holt, Harry L. Munger and Louise A. Bauer.

The Files Engineering Co., Providence, R. I.; $10,000; to manufacture and sell machinery; by William R. Files and William H. Thornley, of Providence, and Hugh H. Baker, of Newport.

The Ideal Coupling Mfg. Co., Manhattan, New York City; $10,000; to manufacture machinery, etc.; by Edmund S. Gibson, Geo. E. R. Rothenbuecher, Wm. Lenz, all of 90 West street, New York City.

The Easiest Way Mfg. Co., Sandusky, O.; $10,000; to manufacture power washing machines, etc., gas engines, motors; by J. F. Donahue, C. Faber Donahue, A. W. Allendorf, E. L. Marsh and C. Webb Sadler.

Pennsylvania Pneumatic Co., Erie, Pa.; $50,000; to manufacture and sell air and gas compressors, vacuum pumps and all kinds of pneumatic machinery; by Otto G. Hitchcock, Chas. Hagenlocher and Edsil Barr, all of Erie.

Hulton Iron Co., Pittsburgh; $5,000; to manufacture iron and steel or both and blooms, bars, plates and other standard shapes, from iron and steel; by Vincent C. Getty and Louis McKelvey, Pittsburgh; Grayson M. Metz, Aspinwall, Pa.

Shafer Decker Co., Rochester, N. Y.; $50,000; automobiles; by C. P. Huge Schoelkopf, 92 Ashland avenue, Buffalo; Charles E. Shafer, Gasport, N. Y.; Frederick J. Decker, 890 University avenue, James S. Shanley, 371 Lake avenue, both of Rochester.

Bartow Iron Ore Co., Wheeling, W. Va.; $150,000; to mine, produce and deal in iron ore, manufacture steel, etc., in Bartow county, Ga.; by J. P. McCammon, L. B. McCammon, W. T. Caldwell, B. E. Hamilton and John A. Howard, all of Wheeling.

Elliott-Bedford Foundry Co., Borough of Queens, N. Y.; $500,000; to manufacture metal goods, foundry, etc.; by Peter Belford, 31 N. Walsh place, Astoria; James E. Elliott, 421 First avenue, Astoria; Reynelle G. E. Cornish, 211 Maple street, Richmond Hill.

Jackson Diamond Saw & Drill Co., Manhattan, New York City; $100,000; to manufacture tools for cutting and boring, etc.; by Forrest S. Chilton, 1657 East Twenty-first; Thaddeus A. Jackson, 405 Third avenue, Brooklyn; Edith L. Parker, 205 West Ninety-fifth street, New York City.

General Industrial

The contract for the structural material for a round house and machine shop for the Western Maryland Railroad Co. has been let. The roundhouse will be erected at the Hagerstown yards of the company, and the shop at Cumberland, Md.

The William A. Hardy & Sons Co., Fitchburg, Mass., has bought a tract of land on Water street, containing 110,000 square feet, formerly owned by the estates of C. T. Crocker and M. E. Lyon. The company has occupied a part of the land about 40 years.

The Haydenville Co., Haydenville, Mass., manufacturer of brass and iron goods for water, steam and gas, has absorbed the Bay State Brass Co., that city. This plant will be operated under separate management. Both companies operate foundries for the manufacture of plumbers' brass goods.

The Duluth Boiler Works, 366-382 Garfield avenue, Duluth, Minn., is working on a contract for supplying the bosh jacket and other parts for the blast furnace being rebuilt by the Lake Superior Iron & Chemical Co.,

at Ashland, Wis. The job called for 120 tons.

The Ames Motor Car Co., Owensboro, Ky., has decided to increase its capital stock to $100,000, and will erect new buildings in an effort to make the yearly capacity 1,500 automobiles. G. W. Yeoman, of Detroit, will be general manager.

The plant of the Homestead Heater & Mfg. Co., Homestead, Pa., is to be offered for sale by the receivers of that company on July 29. The sale will include the building, 111 x 20 feet, two stories, all the stock, gas stoves, castings and other materials. Thomas G. McBride, of Pittsburgh, is the receiver.

The National Malleable Castings Co., Sharon, Pa., is reporting excellent results from the use of its new electric steel furnace that has recently been installed, and a number of representatives of other foundries and steel plants have been visiting this company to inspect the new equipment.

John R. Forbes, Jersey City, N. J., who was forced to abandon his old foundry because the site was needed by the city for a municipal play-ground, has commenced operations within the past week in his new 45 x 100-foot foundry, located near Grand and Golden streets, Jersey City. The new plant has a capacity of three or four tons daily and turns out cast iron grate bars exclusively.

The Santa Fe Foundry Co. has been incorporated at Martinez, Cal., with a capital of $50,000 and will conduct a general foundry and machine shop. The directors are J. W. Mason, Berkley, Cal.; Mayor J. C. Owens and P. W. Penning, Richmond, Cal.; E. C. Chapman, Corte Madera, Cal., and George C. Cross, San Francisco.

The West Penn Paper Co., Pittsburgh, has awarded a contract for an eight-story fire-proof warehouse for its business at Penn avenue and Water street, that city. The company will have a railroad siding into its building with a series of elevators and runways for its teaming. It expects to have the plant completed by Jan. 1, 1913.

The Strathmore Paper Co. will erect a $400,000 plant near its present property at Woronoco, Mass. The new plant will include four buildings, a stockhouse, 147 x 85 feet, machine shop, 195 x 60 feet, finishing mill, 185 x 147 feet, and the fourth building will be 147 x 55 feet. The entire plant will be of brick and concrete construction.

The Lycoming Foundry & Machine Co., Williamsport, Pa., advises that it expects to use the building it is erecting for a brass and aluminum foundry, with capacity of parts sufficient for about 20 motors a day. The building will be rectangular, 40 x 160 feet. The contract has been let for the installation of core ovens and the equipment necessary for operation of the plant.

The Brandenburg Coal & Coke Co. has been incorporated at Charleston, W. Va., with a capital of $100,000, with main offices in Baltimore, Md., for the mining of coal in West Virginia. L. E. Brandenburg and T. B. Hall of Baltimore, and W. C. C. Clarke and E. M. C. Clarke, of Washington, D. C., are interested in the company. It is understood that the company will develop extensive coal property in West Virginia.

The Harrison-Doddridge Coal & Coke Co., with a West Virginia charter, has secured 32,000 acres of coal lands in Harrison and Doddridge counties, W. Va., and with a capital of $200,000 expects to develop coal mines, operate coke plants, and gas wells. C. A. Worthington, E. C. Masten, C. T. Williams, A. C. T. Gordon and Alexander Black, of Pittsburgh, are active in this new company, which has offices in the Frick building, that city.

The Keystone Tube Works, Inc., advises that, in its recent reorganization, W. A. Stone, Uniontown, Pa., was elected president, and in order that he may keep in close touch with the business and to facilitate the handling of correspondence and keep all departments together, it was deemed best to remove the offices to Uniontown, where all mail and telegrams should be sent. The company's facilities are such that it is in constant touch with the mill, so that the change of the offices will in no way interfere with the shipping department.

Concrete forms of the engine bed at the Meadow mills of the American Sheet & Tin Plate Co., at Scottdale, Pa., were completed several days ago, being ready for the filling in of concrete. An electric concrete mixer has been installed and all the cement and sand are on the grounds and the work of installing the large new Corliss engine is being pushed. Many of the furnaces have been torn down and rebuilt or moved to a different position. The entire mill is being given an overhauling. Officials say they expect the mill to be running in full before cold weather sets in.

The Ohio Blower Co., Cleveland, has leased the plant of the Bigsby Mfg. Co., Perkins avenue, that city, and is now located there. The new plant furnishes about 25,000 square feet of floor space, which enables the company to largely increase its output, and it has given up, for the present, its intention of building a new plant, for which a site was secured some time ago. The Blower company has acquired the heavy metal working tools of the Bigsby company and has installed other new equipment in its machine shop. The Blower company makes ventilators, exhaust systems and other products.

Westinghouse, Church, Kerr & Co., New York, have been retained as constructing engineers for the following work, the material and equipment for which has been ordered: The design and installation of all electrical equipment in connection with the extension which is to double the present capacity of the American Cyanamid Co., Niagara Falls, N. Y.; the design and construction of a manufacturing building of mill construction, main building, 44 x 120 feet, with two wings, 30 x 75 feet and 30 x 135 feet, respectively, for the Jones Cold Store Door Co., Hagerstown, Md., and the design and construction of a power plant for the Andrew McLean Co., Passaic, N. J.

Trade Notes

The Continental Engine Co., Chicago, has removed its principal office from Chicago to Dallas City, Ill., and has increased the number of its directors from three to five.

The Allyn Co., Cincinnati, engineers and builders, will soon move to larger quarters on the seventh floor of the Second National Bank building, that city.

Fires

Fire at the plant of the Enameled Steel Tank Co., Kalamazoo, Mich., resulted in a loss estimated at $15,000.

The erecting shops of the Rogers plant of the American Locomotive Co., at Paterson, N. J., were recently damaged by fire.

The plant of the Frank W. Schreiner Machine Co., 361 Buckingham street, Columbus, O., was badly damaged by fire recently.

Damage estimated at $2,500 was done to the property of the Levi Hide & Iron Co., Kokomo, Ind., by fire recently.

Fire is reported to have done serious damage to the works of the Wilson Foundry Co., Des Moines, Ia., which is associated with the Wilson Machine Co.

The new plant of the McCune & Wright Mfg. Co., with flour mills at Bluefield, W. Va., was entirely destroyed by fire last week. Buildings on the same site were destroyed last spring by fire.